

STACKS - S.B.T.



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SAE: Society of Automotive Engineers, Dept. HSL, 400 Commonwealth Drive, Warrendale, Pa. 15096. Order by title and SAE report number.

TRB: Transportation Research Board, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

ABSTRACT CITATIONS

SAMPLE ENTRIES

FORMAT OF ENTRIES IN HIGHWAY SAFETY LITERATURE

NHTSA accession number ----- HS-013 124

Title of document ----- **MAXIMUM BRAKE PEDAL FORCES PRODUCED BY MALE AND FEMALE DRIVERS**

Abstract ----- The object of this research was to obtain data concerning the maximum amount of brake pedal force that automobile drivers were able to sustain over a period of ten seconds. Subjects were told to apply the brakes in the test car as they would in a panic stop, and to exert as much force as possible on the pedal over the entire ten second test period. A total of 84 subjects were tested, including 42 males and 42 females. The results indicated that there is a wide distribution of values which characterizes the pedal force that the subjects were able to generate. Male subjects produced generally higher forces than did females. Over half the women tested were unable to exert more than 150 lbs. of force with either foot alone, but when both feet were applied to the pedal, force levels rose significantly.

Personal author(s) ----- by C. R. VonBuseck

Corporate author (or author's affiliation) ----- General Motors Corp.

Publication date; pagination ----- 1973? ; 18p

Supplementary note ----- Excerpts from Maximum Parking Brake Forces Applied by Male and Female Drivers (EM-23) BY R. L. Bierley, 1965, are included.

Availability ----- Availability: Corporate author

NHTSA accession number ----- HS-018 924

Title of document ----- **NATURAL FREQUENCIES OF THE BIAS TIRE**

Abstract ----- The lowest natural frequencies of a bias tire under inflation pressure are deduced by assuming the bias tire as a composite structure of a bias-laminated, toroidal membrane shell and rigorously taking three displacement components into consideration. The point collocation method is used to solve a derived system of differential equations with variable coefficients. It is found that the lowest natural frequencies calculated for two kinds of bias tire agree well with the corresponding experimental results in a wide range of inflation pressures. Results of the approximate analysis show that the influences of the in-plane inertia forces on natural frequency may be considered small, but the influences of in-plane displacements are large, particularly on the natural frequency of the tire under low inflation pressure.

Personal author(s) ----- by Masami Hirano; Takashi Akasaka

Journal citation ----- Publ: Tire Science and Technology v4 n2 p86-114 (May 1976)

Publication date ----- 1976; 6refs

Availability ----- Availability: See publication

RESPONSE OF BELTED DUMMY AND CADAVER TO REAR IMPACT

Sled impact tests were conducted to simulate the motion of a standard size car at rest impacted from the rear by a second car of equal weight traveling at 32 mph. The test subjects were anthropomorphic dummies and unembalmed cadavers seated in a bench seat (headrest in its lowest position) and three-point belted. In one test mode the seatback was held rigid and in a second test mode the seatback rotated rearward in response to the test subject's impact loading. The major kinematic difference, in either test mode, between the dummies and cadavers was that the dummy head oscillated while the cadaver's head did not. Autopsies indicated that all three cadavers tested with a deflecting seatback suffered neck injuries reaching Abbreviated Injury Scale (AIS) 3 while two of three cadavers suffered similar injuries with a rigid seatback. The third cadaver tested with a rigid seatback had no injury. In respect to this comparison, although the head data in this two-run comparison show that the deflecting seatback is effective in reducing chest and head severity indices, the effectiveness of the deflecting seatback is inconclusive. This is because, in the rigid seatback case, dynamic responses are very sensitive to the change of impact velocities, subject's size and weight, subject's initial position, and so forth, whereas in the deflecting seatback case they are not.

by Anthony S. Hu; Stewart P. Bean; Roger M. Zimmerman
New Mexico State Univ., Physical Science Lab., N. Mex.
Contract DOT-HS-5-01201
Rept. No. SAE-770929; 1977; 38p 6refs
Presented at 21st Stapp Car Crash Conference.
Availability: SAE

HS-021 754

AUTOMATED DIAGNOSTIC SYSTEM FOR MILITARY TRUCKS

A new automated diagnostic system for use in maintenance of military trucks is characterized by its negligible impact on the vehicle reliability, clear and satisfying results, low cost of the on-board equipment, quick application, and easy operation. With the use of this system, maintenance costs are reduced and the availability of trucks increased. Compared to the traditional manual method the automated diagnosis saves 90% of diagnosis time and 30% of total repair time. The automated diagnosis ensures accuracy and repeatability and leads to exact and economic repairs. Using the automated diagnostic system over a longer period of time, new vehicle parameters as a function of lifetime could be created, e.g. the engine compression as a function of mileage. Such parameters then could be used for a very early diagnosis of abnormalities or malfunctions. Presently, in Germany, automated diagnostic systems are also being applied to combat vehicles and tanks. These vehicles are far more expensive than trucks and require between 250 and 500 test points. In this case the application of on-board multiplexing devices may be reasonable in the future.

by Ernst K. Fallert
Bundesamt für Wehrtechnik und Beschaffung, West Germany
Rept. No. SAE-760835; 1976; 8p
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

CHALLENGES AND PROBLEMS IN A TRUCK DIAGNOSTIC CENTER

The following six basic areas have potential for effective utilization of diagnostics in a truck center operation involving both sales and service: diagnosis as a separate service-sales commodity, planned or preventive maintenance (PM), used truck evaluation and reconditioning, new truck pre-delivery, shop quality control, and technical problem isolation. The following are problems that must be considered in offering diagnostic service: diagnostic equipment capability limitation, especially diesel; personnel operating the equipment; and equipment maintenance and repair. How effectively diagnostics can be made to work in the Truck Service Center environment is dependent primarily on the total planning effort devoted to its application. Factors such as market potential, personnel, facilities, location, and management support will result in varying outcomes for individual facilities, but the challenge remains essentially the same for all, i.e. to provide service capability commensurate with the demands and needs of today's truck operator. To illustrate how potential translates into reality in an actual operation, a summary is presented of the conclusions drawn from a recent six-month study comparing a diagnostic equipped (including chassis dynamometer) Truck Service Center with four comparable facilities not offering diagnostics (other than that smaller test equipment found in most truck repair centers).

by Charles D. Alar
General Motors Corp., GMC Truck and Coach Div.
Rept. No. SAE-760836; 1976; 8p
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 756

THE PRACTICAL REALIZATION OF AN AUTOMATED DIAGNOSTIC SYSTEM FOR DIESEL POWERED VEHICLES

A microprocessor-controlled test system has been developed to fulfill the increasing need for an automated diagnostic test system for diesel-powered vehicles. It is sufficiently flexible to fully meet the test requirements of any diesel-powered vehicle and can also be utilized for off-highway applications and for the checkout of diesel-powered electric generators. The hardware is fully adaptable to any test condition through the appropriate selection of sensors and the compiled test program. This system provides a means whereby the history of the vehicle can be preserved both as a hard-copy printout and in digital format for access via computer terminal. A diagnostic analyzer fully utilizes the mechanic in the test loop and rapidly provides diagnostic information on faults which are difficult and time-consuming to accurately isolate manually. The translation of these requirements into realizable hardware is fully delineated. An operational test sequence as actually implemented for the testing of several different diesel-engine types is given.

by Edward J. Fuller
PRD Electronics Div.
Rept. No. SAE-760838; 1976; 19p 9refs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 757

THE 390V--A NEW FIVE-SPEED MECHANICAL TRANSMISSION FOR TRUCKS

A new five-speed mechanical transmission for medium and medium-heavy trucks, the 390V, is described. One of the major design objectives achieved was more capacity in a smaller, lighter package. All gears are helical with high helix angles in front (35°) gradually reducing to the rear where low gear has a 12° helix angle. All gears on the countershaft have the same lead; the thrusts are then theoretically balanced. A computer program was developed to provide results of sets of parameters; it provided pitting life and bending life based on data and formulas previously published in SAE papers. The design criterion was set at the B50 life for spalling and pitting, and each gear was checked to make certain that bending life was at least three times the pitting life at the design torque for that gear set. A 2:1 derating of the B50 bearing life was provided to account for other than ideal bearing operating conditions in the transmission. Testing of the 390V involved laboratory dynamometer testing, vehicle evaluation and endurance testing, and fleet testing. The 390V was released for production tooling in Jul 1974. Appended is laboratory test information on ball bearings used in truck transmissions.

by Robert W. Wolfe
Clark Equipment Co.
Rept. No. SAE-760839; 1976; 16p
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 758

THE MT644 AND MT654CR. TWO NEW AUTOMATIC TRANSMISSIONS FOR HIGH-TORQUE, LOW-SPEED DIESELS

Two new automatic transmissions, the MT644 and the MT654CR, have been developed to fill a market need for use with a class of heavy-duty, low-speed diesel engines. In the conception, planning, designing, and developing of these units, both domestic and overseas markets were analyzed, and current vehicle factors and trends were considered. The versatility of the modular concept employed by the MT600 and HT700 transmission series has made it possible to utilize the high-volume MT600 series center section and the HT700 input or converter module in these new products with only minor change. While the modular concept has resulted in over 75% of the parts of both new models being common to the MT600 and HT700 series, the new transmissions incorporate a number of new or improved features such as increased-capacity torque converter for high-torque engines, increased-flow oil pump for better cooling, and modulated converter lockup for greater fuel economy. Also, minimum impact on OEM installation requirements was achieved. The on-highway performances of the transmissions were simulated, and the results of the computer runs graphed. Applications by vehicle type and purpose are tabulated, with annotations of typical GVW/lb, on-grade startability, special gearing, and engine type.

by A. C. Huevel
General Motors Corp., Detroit Diesel Allison Div.
Rept. No. SAE-760840; 1976; 12p
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 759

NEW LIGHT WEIGHT FOUR AND FIVE SPEED TRANSMISSIONS WITH OVERDRIVE OPTION FOR CLASS 1 AND 2 VEHICLES

A new four-speed manual transmission, Model 3400, and a new five-speed manual transmission, Model 3500, with overdrive option and lightweight aluminum case are designed and developed specifically for light truck Class 1 and 2 vehicles of up to 10,000 pounds GVW. Both models use a die cast aluminum transmission case. The models are designed to provide either a side shift requiring a vehicle-mounted shift system or a tower shift with integral conventional stick control. Both conventional and overdrive gear ratios are tabulated for each model. Typical power flow charts are provided. All forward speeds are constant mesh design. Bearing arrangement and case design are illustrated. The lightweight assemblies are interchangeable with transmissions currently specified. Added important characteristics are improved fuel economy, particularly with the overdrive ratio; quiet operation; and much easier shift efforts as a result of the less massive components.

by G. E. Huffaker
Chrysler Corp., New Process Gear Div.
Rept. No. SAE-760841; 1976; 15p
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 760

A THEORY ON THE RELATIONSHIP BETWEEN DRIVE TRAIN VIBRATION AND BELT-DRIVEN ENGINE COOLING FAN FATIGUE FAILURES

An investigation was conducted to determine if there was any relationship between fatigue failures observed in a belt-driven engine cooling fan, and engine crankshaft torsional vibration. The fan fatigue failures indicated the presence of significant vibration activity. A testing and analysis program was undertaken in an effort to measure the fan vibration characteristics in a vehicle environment and relate these characteristics to some known source of excitation. The classical vibration analysis of a fan and fan pulley coupled to a crankshaft pulley by a drive belt commonly predicts the fan to be effectively isolated from crankshaft vibration. The results of this testing program, however, indicated the presence of significant torsional and linear vibration at frequencies that corresponded to crankshaft torsional vibration orders, and thus indicated a complex mechanism of energy transfer through the belt system. It is believed that the dynamic response of a belt-driven accessory is strongly affected by a secondary wave resonance phenomenon, commonly referred to as "belt flapping" or "belt flutter." The simplified linear theory on the characteristics of a standing wave may be used to approximate the high-frequency response characteristics of a belt-driven accessory. However, a working mathematical model suitable for the prediction of belt-driven accessory dynamic impedance must account for the significant nonlinear behavior of elastomeric belting.

by Robert C. Bremer, Jr.
Schwitzer Engineered Components
Rept. No. SAE-760842; 1976; 24p Srefs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 761

THE TRUCK DRIVELINE AS A SOURCE OF VIBRATION

The truck driveline is a source of vibration due to such factors as driveshaft unbalance or by such joint angle problems as torsional excitation, inertia excitation, and secondary couple effect. Allowable unbalance at each end of a driveshaft is tabulated, and allowable offset of lug span and crossholes in relation to spline is diagrammed. Driveshafts and coupling shafts should be straightened after welding the tubing to the end fittings but prior to balancing. Joint angle vibrations are caused by nonuniform rotational output of a single cardan type universal joint operating at an angle. The vehicle disturbances they cause can be reduced by reducing joint angles. Driveline vibrations may also be caused by system bending resonance. The majority of the trucks that are built today have drivelines that are relatively vibration free, and adhering to established straightening, balancing, and application guidelines for driveshafts will usually assure that the driveline will not have an unacceptable level of vibration.

by Robert G. Joyner
Dana Corp., Universal Joint Div.
Rept. No. SAE-760843; 1976; 15p 1ref
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 762

MEASUREMENT AND ANALYSIS OF TRUCK POWER TRAIN VIBRATION

A discussion of the measurement and analysis of truck power train vibration is presented. The measurable characteristics of mechanical vibration include displacement, velocity, acceleration, frequency, and phase. Vibration can usually be adequately measured by velocity, but in some cases measurement of displacement or acceleration might be preferred. Charts are given of general machinery vibration severity and of vibration acceleration general severity. Typical equipment available for measuring and analyzing truck vibration, including transducer selection and mounting considerations, is discussed. Suggested procedures for analyzing truck power train vibration are presented along with sample analysis data illustrating the identification of specific vibration sources. A vibration identification chart is presented. Problems such as unbalance of the engine, clutch, cooling fan or other rotating components; looseness; resonance; misalignment; defective bearings and gears can be readily identified by carefully comparing the vibration amplitude, frequency and phase characteristics unique to each problem. Unbalance, perhaps the most common cause of excessive vibration, can normally be corrected in place.

by Randall L. Fox
IRD Mechanalysis, Inc.
Rept. No. SAE-760844; 1976; 27p 3refs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 763

MODIFICATIONS OF STEERING AXLE CAM BRAKES FOR FMVSS 121

Modifications which had to be made to steering axle cam brakes in order for them to comply with Federal Motor Vehicle Safety Standard (FMVSS) 121 are discussed. The increased torque levels required on front axles of air brake vehicles to comply with the 60 miles per hour, 245 foot stopping distance of FMVSS 121 created brake packaging problems not only due to the brake assemblies being larger for a given axle weight, but due to the inclusion of antilock hardware and the larger front axles. To produce the additional torque, increased brake input power was needed, necessitating material and design changes of the basic foundation brake. Front brake torque increases of twice the previous level were found to be necessary in many vehicle configurations. Brake widths were increased to control wear rate, since front axle brakes were doing more energy dissipation. New lining materials were chosen which had a substantial friction increase. Backing plate gauge was increased on certain size axles; larger bolts and bolt circle and pilot diameters were also used. Shoe design was strengthened, and anchor pin material sometimes upgraded. Air chamber and cam shaft bracket were designed as a malleable casting. Chambers were located further inboard on the vehicle. Lining length was increased.

by Paul G. Marting
Wagner Electric Corp.
Rept. No. SAE-760845; 1976; 14p 3refs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 764

ANALYSIS OF COAST-DOWN DATA TO ASSESS AERODYNAMIC DRAG REDUCTION ON FULL-SCALE TRACTOR-TRAILER TRUCKS IN WINDY ENVIRONMENTS

A data reduction procedure is presented and successfully used to analyze coast-down data obtained in a windy environment to provide a measure of the aerodynamic drag on a full-scale tractor-trailer combination as a function of the yaw angle of the vehicle. Full-scale drag coefficients were evaluated for a vehicle operated in the baseline mode, and following the addition of four different drag-reducing combinations, over a yaw angle range of from -10° to 10° . Comparison with wind tunnel measurements suggests that the wind tunnel provides a reasonable simulation of the effects of winds on vehicle drag. The full-scale drag reductions measured in the presence of winds were generally lower than those found in wind-tunnel tests, except in situations where a vertical gap seal device was present. In this case, there was good agreement between the results of the coast-down tests and the wind-tunnel tests. The highest drag reductions that were measured in the presence of winds were obtained with a streamlined fairing/gap seal combination, which produced a 32% drag reduction at 0° yaw, and a 21% reduction in wind-averaged drag. The drag reductions obtained with the roof fairing, with and without gap seals, significantly exceeded those obtained with a commercially availa-

device.

by Frank T. Buckley, Jr.; Colin H. Marks; William H. Walston, Jr.
University of Maryland, Mechanical Engineering Dept.
Grant NSF-RANN-SIA74-14843
Rept. No. SAE-760850; 1976; 16p 8refs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 765

OPTIMIZATION STUDY OF LIQUID-TO-AIR HEAT EXCHANGER IN THE COOLING SYSTEM OF MILITARY COMBAT/TACTICAL VEHICLE

An optimization study of a liquid-to-air heat exchanger in the cooling system of a military combat/tactical vehicle concluded that the air-flow resistance through the entire cooling system should be estimated as accurately as possible and should be used in the design and optimization process of the exchanger core. The exchanger core should be designed and optimized considering the lowest possible fan power requirement as criterion. The higher the system resistance in the air-flow path, the larger is the core thickness recommended if all other parameters are unchanged. When the heat transfer rate of the exchanger, and/or the inlet air temperature to the exchanger increases, the recommended core thickness also increases if minimum fan air power requirement is considered as the design criterion. When the inlet liquid temperature to the exchanger increases, the power-optimized core thickness decreases. In the subject vehicle, the air-flow resistance through the exchanger core is normally a small portion of the system resistance through the entire air-flow path. The air-flow resistance through the inlet and exhaust grilles and that through the power plant compartment contribute the predominant portion of resistance through the entire system. This is different from the situation in a commercial vehicle where the air-flow resistance through the exchanger core usually is the only noticeable air-flow resistance of the entire system. Therefore, there is a basic difference in the recommended exchanger core configurations used in both types of vehicles. Using an exchanger with a smaller core-face area and thicker core (thicker than the core commonly used in a commercial vehicle) is feasible, and sometimes it is more favorable for the subject vehicle.

by Jiunn P. Chiou
University of Detroit
Rept. No. SAE-760851; 1976; 14p 12refs
Presented at Truck Meeting, Indianapolis, Ind., 1-4 Nov 1976.
Availability: SAE

HS-021 766

THE TREND TO SMALLER AND LIGHTER CARS-- DOES IT PRESENT AN INCREASED CHALLENGE TO THE CHASSIS ENGINEER?

The physics of the motor car make it more difficult for the chassis engineer to achieve ride, handling, and braking performance levels in smaller cars which are comparable to the performance levels achievable in larger cars. In the smaller car, the payload constitutes a larger percentage of the curb weight than is the case in the larger car. The smaller car experiences a relatively larger shift in the longitudinal location of

on steering on the smaller car is much more difficult. Smaller vehicles typically exhibit higher ratios of center of gravity height to wheelbase and track width. The smaller car has a significant amount of inertial coupling between bounce and pitch motions; pitching accelerations are larger for the smaller car when it traverses a given amplitude of road roughness. It has larger angular accelerations in yaw for a given yawing moment disturbance acting on the vehicle. The mass distribution of the smaller car relative to its wheelbase requires a relatively greater engineering effort to achieve the ride comfort of the larger car. The shorter the wheelbase and the track of a vehicle traversing a rough road, the larger will be the pitch and roll disturbance. Smaller cars have larger aerodynamic disturbances per unit lateral resistance of their tires and are thus more difficult to control in a crosswind. Design trends aimed at making the motor car a more efficient transporter of people contrast markedly with current ideas for making the motor truck a more efficient transporter of freight.

by Leonard Segel
University of Michigan, Hwy. Safety Res. Inst.
Rept. No. SAE-770040; 1977; 8p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 767

UFIS - A NEW DIESEL INJECTION SYSTEM

A new diesel injection system, the UFIS (Universal Fuel Injection System), provides the capability of universal application to a wide range of existing engines. It also provides the injection quantities, characteristics, and timing variations which may be needed by the new high-performance diesel engines with emphasis on gaseous emissions and noise. It is an electrohydraulic system using unit injectors which are electronically controlled and operate on the common rail principle. The system features positive-displacement fuel metering, hydraulic-pressure amplification, and nozzle-valve control. The system is highly flexible and can achieve injection characteristics beyond the capability of conventional systems.

by J. A. Kimberley; R. A. DiDomenico
AMBAC Industries, Inc., American Bosch Div.
Rept. No. SAE-770084; 1977; 8p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 768

A NEW LOOK AT WEAR METAL ANALYSIS

Spectrographic oil analysis techniques are used to measure metal concentrations in crankcase oil. Changes in ppm of a given metal over time indicate wear rates of internal metal parts. A quantitative relationship is established between wear rate, wear metals concentration, and oil consumption. Metal worn from an engine component will be in part in the crankcase, in part carried away with the oil consumed, and in part carried out with oil samples for analysis; these influences must be allowed for in the analysis. Analysis begins with establishing the relationship when new oil is added continuously; then discrete additions and samples are added, and finally wear rates are developed from a sequential set of wear metals concentration readings for a given engine. A separate analysis

must be performed for each metal to be measured. An example is given which shows how much the apparent wear rate can vary. Equations for deriving the corrected wear rate are presented and explained. The method assumes that wear metals do not settle out or get removed by the filter, and that oil consumption and wear are linear functions of time or distance traveled.

by Malcolm L. Land; Ward O. Winer; Charles F. Schwarz
Rept. No. SAE-770085; 1977; 8p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 769

THE EFFECT OF OIL AND COOLANT TEMPERATURES ON DIESEL ENGINE WEAR

Using literature data and new experimental results, a study was made of piston-ring wear and total engine wear with the main objective of establishing the effects of oil and coolant temperatures on engine wear. Wear trends that were found in the early 1960's may no longer be valid because of the development of higher BMEP (brake mean effective pressure) turbocharged diesel engines, better metallurgical wear surfaces, and improved lube oil properties. New data are presented for the purpose of describing present wear trends. A direct-injection, four-cycle, turbocharged diesel engine was used for the wear tests. The radioactive tracer technique was used to measure the top piston ring chrome face wear. Atomic emissions spectroscopy was employed to determine the concentration of wear metals in the oil to determine total engine wear based on iron and lead. The data were analyzed and compared to the results found in the literature from previous investigators. Test results show that top piston ring wear rate increased with increasing load and outlet coolant temperature. Engine wear, in general, increased with increasing coolant temperature. Top piston ring wear was affected little by inlet oil temperature. And, both lead and iron concentration in the oil increased as oil temperature increased, but a peak occurred in the wear rate for the 205° F outlet coolant temperature condition at 180° F inlet oil temperature. The test results exhibited the same trends as shown in the literature review, except for the effect of coolant temperature which was shown by the literature to be increasing ring wear rates with decreasing coolant temperature below 150° F. The same trends are that ring wear rates increase with load, and that bearing wear rates (lead) should be expected to increase with load and oil temperature.

by David A. Bolis; John H. Johnson; Donald A. Daavetilla
Michigan Technological Univ.
Rept. No. SAE-770086; 1977; 16p 39refs
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 770

CAM AND LIFTER WEAR AS AFFECTED BY ENGINE OIL ZDP CONCENTRATION AND TYPE

To determine the effects of oil additives on camshaft and lifter wear, controlled fleet tests were run using 1972-1974 model cars, unleaded gasoline, and either SE commercial oils or experimental formulations as well as tests using customer service

fleets (1970-1975 model trucks), leaded gasoline, and SE/CC or SE/CD oils. With some commercial oils, in both controlled tests and field experience, excessive wear sometimes occurred after extended service, even with recommended oil-change intervals. Generally, protection from excessive wear was best provided by those oils containing predominantly alkyl zinc dithiophosphate (ZDP) antiwear additive instead of aryl ZDP. These results show that a laboratory engine test is needed to evaluate the long-term protection of engine oils.

by Loren G. Pless; John J. Rodgers
General Motors Corp., Fuels and Lubricants Dept.
Rept. No. SAE-770087; 1977; 16p 12refs
Presented at International Automotive Engineering Congress and Exposition, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 771

BONDING WITH ANAEROBIC ADHESIVES IN THE AUTOMOTIVE INDUSTRY

A particular form of anaerobic adhesive, the retaining compound, is used in the bonding of fitted cylindrical parts utilized in the automotive industry. The anaerobic-retaining compound offers benefits over traditional mechanical methods (e.g. press fits, splines, pins, screws, keys) in the mating of cylindrical parts such as the mounting of bearings, gears, pulleys, fans, cams, collars, and flywheels. Possible benefits include increased reliability through greater strength, relaxation of machining tolerances, increased production rates, and reduction in rework and warranty costs.

by J. William Paris
Locitite Corp.
Rept. No. SAE-770089; 1977; 8p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 772

BOND THICKNESS EFFECTS UPON STRESSES IN SINGLE LAP ADHESIVE JOINTS

Study of the influence of bond thickness upon the stress distribution in single-lap adhesive joints extends the basic approach for bonded joints, originally introduced by Goland and Reissner, through the use of a more complete shear-strain/displacement equation for the adhesive layer. This refinement was not found to be included in any of the numerous analytical investigations reviewed. As a result of the approach employed, the investigation uncovered several interesting phenomena without adding any significant complication to the analysis. Besides modifying some coefficients in the shear stress equations, completely new terms in the differential equation and boundary conditions for bond peel stress were obtained. In addition, a variation of shear stress through the bond thickness, no matter how thin it may be, is analytically predicted only by the present theory. This through-the-bond-thickness variation of shear stress identifies two antisymmetrical adherend-bond interface points at which the shear stresses are highest. The growth of joint failures

originating from these points agrees with results obtained from actual experiments.

by I. U. Ojalvo; H. L. Eidinoff
Grumman Aerospace Corp.
Rept. No. SAE-770090; 1977; 12p 6refs
Presented at International Automotive Engineering Congress
and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 773

PEDESTRIAN INJURIES AND THE CAR EXTERIOR

The relative importance of pedestrian accidents as a source of road accident trauma is shown by reference to national and international data; the methodology of pedestrian accident investigation at Birmingham Univ. (England) and results of a recent study used to describe the general characteristics of pedestrian accidents are presented. The proportion of pedestrian casualties can be expected to increase with improved vehicle occupant protection. Children form a large percentage of the pedestrian casualties, but a smaller proportion of the pedestrian fatalities because of the increased susceptibility of the elderly to sustain serious injury and to die from injuries of a given severity. The car is the vehicle most frequently involved in pedestrian accidents, and the pedestrian is most likely to be struck by the front of the vehicle. Pedestrians are normally struck from the side and are more likely to have been crossing from the nearside of the road than from the offside. A large proportion of the child casualties will have been running when struck. For pedestrians struck by the fronts of cars, it appears that elderly adults sustain more serious injuries than adults at comparable impact speeds, and that children are less likely to sustain severe injuries than adults. For those sustaining minor injuries, the legs were the body area most frequently injured, followed by the head and the arms. With increasing injury severity the head takes over as the body area most frequently injured. Head injuries were the most frequent cause of death. The bumper was the main cause of vehicle-induced, nonminor leg injuries, being responsible for over half these injuries. The leading edge of the hood was the next most frequent cause, being responsible for over one third of the injuries. The SAE recommended practice on bumper location results in a high percentage of direct knee contacts by the bumper. A lower bumper height is likely to produce a more favorable condition for the pedestrian. Life-threatening or fatal head injuries appear to be caused more frequently by head contact with the vehicle than with the ground. It was found that the windshield frame was the main cause of vehicle-induced serious head injuries.

by S. J. Ashton; J. B. Pedder; G. M. MacKay
University of Birmingham, Dept. of Transportation and
Environmental Planning, Birmingham, England
Rept. No. SAE-770092; 1977; 20p 16refs
Presented at International Automotive Engineering Congress
and Exposition, Detroit, 28 Feb-4 Mar 1977; supported by the
Transport and Rd. Res. Lab.
Availability: SAE

HS-021 774

INJURY SEVERITY FACTORS--TRAFFIC PEDESTRIAN COLLISIONS

The injuries of pedestrians involved in collisions with motor vehicles were analyzed in order to detect relationships

between injury severity and documented observations. Data on pedestrian injury and involvement were obtained from 265 accidents studied by the Cornell Aeronautical Lab. in Toronto, Canada during 1969-1970, 175 accidents studied by the University of Houston (Texas) during 1971-1973, and 47 accidents studied by the National Hwy. Traffic Safety Administration-sponsored multidisciplinary teams scattered throughout the U.S. The data were reviewed in order to correlate injuries with pedestrian age, area of body contacted, vehicle or environment contact surface, and impact speed. The objective was to evaluate vehicle design and configuration as a possible means of reducing the severity of injuries inflicted upon the pedestrian when contacted by a motor vehicle. Preliminary analysis of the data shows that impact speed dominates the variables which were explored to determine the injury mechanisms for pedestrian-motor vehicle collisions, that there is a strong relationship between injury severity and a body area-contacting surface interactive factor, and that injuries to the head have higher probabilities of having critical severity as compared to the other body areas. Also, highway and environmental surfaces contacted as secondary impacts to the pedestrian generate lower injury severities, fractured necks were observed as a fatal injury in a large percentage of the fatalities, and pedestrian age may have a minor influence upon the resulting injury severity.

by K. J. Tharp; N. G. Tsongos
University of Houston; National Hwy. Traffic Safety
Administration
Rept. No. SAE-770093; 1977; 12p 5refs
Presented at International Automotive Engineering Congress
and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 775

OPTIMAL DESIGN OF AUTOMOBILES FOR PEDESTRIAN PROTECTION

With the objective of determining the physical properties which a vehicle front end and hood should possess in order to minimize the injury to a pedestrian struck by the vehicle, a system of computer programs has been developed and applied to simulate the injuries suffered by a pedestrian struck by an automobile. The system provides a semiautomatic search for safer hood/grille/bumper configurations and stiffnesses. After the software system was developed, three major optimizations, interspersed with modeling changes to improve the accuracy of the simulations, were performed. Results from the optimization series were used to help design full-scale impact tests using child and adult dummies. In turn, experimental measurements were used to improve the mathematical model of the impact simulator. The results of these studies have provided some insights into vehicle design parameters which produce safer vehicles. Much was learned about modeling the pedestrian motion; the method of modeling joint dynamic and static properties is critical, and the ability to model inelastic failure of the joints is essential. Pedestrian simulation with its complex body/vehicle impacts places greater demands on a simulation program than crash simulations of a victim restrained by seat belt, shoulder harness or air bag inside a crashing vehicle. A simple geometric rule explaining the factors which determine the optimal hood shape for a particular pedestrian was not found. Although a hood geometry was found which was near optimal for two widely differing pedestrians (an adult and a child), this geometry cannot be assumed to protect a large spectrum of the population in a variety of situations. The principal design problem is that of

hood surface had a large coefficient of friction, an arm or elbow thrown out by the pedestrian at the hood protected the head. The most critical factor associated with the stiffness properties of the hood is the available crush distance, i.e. the thickness of the padding. Mere softness without crush depth affords little protection because the material quickly bottoms and loses its softness. Padding the upper hood with foam is more effective than a sheet metal hood with an equivalent buckling distance. The sheet metal upper hood surface can provide considerable crush distance, by dimpling inward. Padding the grille and bumper does significantly reduce lower body injury.

by David W. Twigg; James L. Tocher; Rolf H. Eppinger
Boeing Computer Services, Inc.; National Hwy. Traffic Safety Administration
Contract DOT-HS-356-3-719
Rept. No. SAE-770094; 1977; 16p 11refs
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 776

EXPERIMENTAL INVESTIGATION OF PEDESTRIAN INJURY MINIMIZATION THROUGH VEHICLE DESIGN

Experimental pedestrian/vehicle impacts have been conducted using a 50th percentile adult and a six-year-old size child dummy in an ongoing program to investigate the injury reduction potential of changes in the front end of a vehicle. Peak resultant acceleration levels and Gadd severity index versus vehicle velocity for the head, chest, pelvis, and knee of each dummy are presented for vehicle fronts that include production compact and full-size vehicles, a potential-injury-mitigating concept vehicle, and the Calspan research safety vehicle (RSV). From the general analysis of the results of experimental impacts to date, a vehicle configuration has been defined that is expected to further reduce the acceleration levels of the pedestrian surrogates. Its profile will be similar to the padded Impala, i.e. somewhat square with a reasonably low bumper height. The compliant materials will be nine inches thick for the bumper-edge and hood-edge areas and three inches thick for the hood. The specific compliances will be selected using localized pendulum impact data to optimize the energy absorption characteristics, i.e. to yield impacts without bottoming or generating unacceptably high acceleration levels and to have a slow recovery rate which should improve the dynamics preceding the ground impact phase of the accident.

by Howard B. Pritz
Battelle's Columbus Labs.
Rept. No. SAE-770095; 1977; 10p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 777

HY-POWER BRAKE BOOSTER FOR FMVSS-105 BRAKE REQUIREMENTS

In anticipation of hydraulic brake system standards for medium-duty trucks requiring dual-brake systems and stringent stopping distances, Federal Motor Vehicle Safety Standard

of power, the Hy-Power, was developed. An electric motor-driven pump is used to provide hydraulic power for the reserve booster system. The dual master cylinder is 1.75 inches in diameter with a 5.12 cubic-inch total fluid displacement. The Hy-Power system provides 2000 PSI brake pressure at 150 pounds pedal force. The reserve system provides 1000 PSI at 150 pounds pedal force. A third, or manual, mode of operation is provided in the unlikely event the primary and reserve systems are inoperative. Other significant features include performance that is unaffected by mountain driving, a reserve power system that gives normal stopping capacity for a countless number of stops, maintenance problems that are minimal because of the small number of parts and critical connections, a compact space-saver package that eliminates frame rail boosters and tanks to provide easy body mounting plus space for other components, an under-hood mounting that is convenient for servicing, and a warning light and buzzer system for indicating system malfunction.

by J. W. Miller; R. A. Horvath
General Motors Corp., Delco Moraine Div.
Rept. No. SAE-770096; 1977; 11p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 778

BRAKE SYSTEM DESIGN FOR MEDIUM/HEAVY TRUCKS TO MEET FMVSS 105-75 STOPPING DISTANCE REQUIREMENTS

A comparison is made of the federally imposed standard, Federal Motor Vehicle Safety Standard (FMVSS) 105-75, with the industry standard, Society of Automotive Engineers (SAE) J786a/J992b, in order to quantify the amount of brake system upgrading that was a necessary consequence of FMVSS 105-75, Notice 11. Acceptable range of front and rear brake torques necessary to meet a given level of vehicle deceleration is determined mathematically. Brake torque capabilities need to be increased and the range of percent front braking that would be acceptable to meet the stopping distance requirement without tire slide needs to be narrowed. A statistical approach is used to determine the probability of the brake system meeting the stopping distance requirements of FMVSS 105-75. Special vehicle and laboratory tests were constructed to obtain vital information relative to the statistical analysis. Performance characteristics of the Bendix truck disc brakes are displayed, including stopping capability, life, controllability, and structural integrity. Testing prerequisites are summarized.

by M. E. Gatt
Bendix Corp.
Rept. No. SAE-770097; 1977; 19p
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 779

EVALUATION OF VEHICLE INSTALLED WHEEL LOCK CONTROL HARDWARE WITH A HYBRID COMPUTER SIMULATION

A real-time hybrid computer simulation interconnects with the wheel lock electronic controller-modulator hardware and air brake system of a multiple axle truck to provide a laboratory tool for simulating vehicle braking performance. The technique provides controllable vehicle and road characteristics for evaluating the actual wheel lock and vehicle pneumatic system hardware. The vehicle model includes the vehicle sprung body, suspension, axles, and four independent wheels which allow split coefficient and brake imbalance simulation studies. A brake model with temperature fade characteristics is also included. The simulation produces speed sensor signals through special interface modules for the wheel lock electronic controllers, while the vehicle is instrumented to generate brake chamber pressure signals and mode control signals for the hybrid computer. Brake pressure and speed sensor signals are trunked between the hybrid computer and vehicle, which are located in adjacent rooms. A preliminary simulation correlation study and data review are presented using a General Motors 9500 series 4x2 truck. The simulation allows for elimination of wheel lock controller, modulator valve, and pneumatic system hardware models, quick evaluation of new wheel lock concepts and vehicle parameter studies, and the capability of investigating problems of wheel lock or air brake systems with a specific vehicle. The limitations of the simulation are that it is difficult to model and modify road/tire coefficient characteristics, the brake fade model may require additional analysis, and a medium-size hybrid computer with associated interface hardware is required.

by R. A. Grimm; R. J. Bremer; F. J. Jain; W. A. Levijoki
General Motors Corp., AC Spark Plug Div.
Rept. No. SAE-770098; 1977; 12p 12refs
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 780

MEDICAL ASPECTS OF HEAD PROTECTION FOR CYCLISTS

The proceedings of a 21-member conference on medical aspects of head protective devices for motorcyclists are thematically reviewed. Presentations at the conference dealt with helmet design, manufacture, and testing, the severity of non-fatal head injuries to cyclists, research of the multidisciplinary accident investigation (MDAI) team at the Univ. of Southern California, accident data research in Ottawa, Canada, and the severe temporal and facial injuries associated with motorcycle crash injuries. The direct medical aspects of cycle crashes are reviewed according to area or factor of injury: cervical spine, clavicle, chin strap and chin cup, peripheral vision, helmet weight, and auditory aspects. Discussion of related medical aspects deals with alcohol involvement, speed, effects of accessories, tinted face shields and visors, thermal aspects, sense of overconfidence, and improper helmet removal. Every rider or driver of a motorcycle should wear a properly fitted and approved helmet, preferably one which gives full facial

coverage. Mopedists and bicyclists are also encouraged to do so. Conference participants and staff are listed.

American Medical Assoc.
1977; 24p 40refs
Cover title: "Head Protection for the Cyclist. A Medical Inquiry." Conference held in Washington, D.C., 14 Apr 1977.
Availability: Corporate author

HS-021 781

A REANALYSIS OF CALIFORNIA DRIVER VISION DATA: GENERAL FINDINGS

Data on over 14,000 drivers from the 1967 California driver vision study were reanalyzed with a view to establishing their implications for driver vision standards. The tests dealt with static visual acuity, low-light recognition threshold, glare recovery, field of vision, and dynamic visual acuity. The major dependent variable was accidents per 100,000 vehicle miles. Drivers whose average annual mileage was under 1000 were excluded. For the main analysis the sample was divided into four age groupings: under 25, 25-39, 40-54, and over 54. The most consistent result was the failure to find a direct relationship between poor visual performance and high accident rates for young and middle-aged drivers. For the over 54 age group, dynamic and static visual acuity showed the most consistent relationships with accident rates, but for an individual driver their accident prediction value remained very low. A more detailed age analysis failed to define more precisely the age at which these relationships develop. No evidence was found to support the use of total visual field as a driver screening test. The results for two tests of night vision were regarded as inconclusive for the over 54 age group. For the same nominal standard of binocular static visual acuity, the Ortho-Rater screener was found to fail markedly fewer drivers than the Snellen wall chart. The implications of varying the cut-off scores for each test were investigated, and the suggestion made that perceptual rather than sensory tests with greater accident predictive power would be needed before acceptable alternative screening methods could be specified for driver licensing purposes.

by B. L. Hills; A. Burg
Transport and Rd. Res. Lab., Crowthorne, Berks., England;
University of California, School of Engineering and Applied Science, Los Angeles, Calif.
Rept. No. TRRL-LR-768; 1977; 45p 18refs
Availability: Transport and Rd. Res. Lab., Rd. User Characteristics Div., Crowthorne, Berks., England

HS-021 782

STAPP CAR CRASH CONFERENCE (21ST) PROCEEDINGS, OCTOBER 19-21, 1977, NEW ORLEANS, LOUISIANA

Twenty-seven papers are presented on impact response, accident and injury characteristics, and effectiveness of restraint systems. Specific topics include simulation of free-falls, severe accidents in Switzerland in 1976, differences between matched samples of 200 car occupants, side collisions, frontal crashes, moped drivers, and motorcyclists. Other topics include head impact response, intracranial pressure dynamics, prediction of brain injury measures, dynamics of human leg joints, femur injury criterion, and stereoradiographic measurements. Also included are papers on dynamic and inertial responses to im-

restraint system, biomechanical evaluation of restraints, and Part 572 dummies. Final papers concern Hybrid III, computerized side impact injury analysis, models of child occupants, and pedestrian accidents.

Wayne State Univ.; University of California -- San Diego; University of Michigan, Hwy. Safety Res. Inst.; Society of Automotive Engineers, Inc.
Rept. No. SAE-P-73; 1977; 1097p refs
Conference hosted by Naval Aerospace Medical Res. Lab.
Includes HS-021 666--HS-021 668; HS-021 783--HS-021 806.
Availability: SAE

HS-021 784

ADVERSE EFFECTS OF SEAT BELTS AND CAUSES OF BELT FAILURES IN SEVERE CAR ACCIDENTS IN SWITZERLAND DURING 1976

Results of a one-year field study initiated by the Swiss Federal Police Dept. in connection with a mandatory seatbelt law are presented; 304 accidents with 153 killed and 257 severely injured belted occupants were analyzed. Problems discussed are: frequency and statistical significance of cases in which, with a high degree of probability, the belt had an adverse effect, relevant injury patterns, frequency and causes of belt failures, including releasing difficulties after a crash, and possible improvements. The applicability of Calspan's simulation model of automobile collisions (SMAC) method is demonstrated and discussed. In case of car to car collisions the mass ratio is shown to be important. A correlation analysis between the velocity change during the collision phase and the injury severity is performed. Special attention is given to frontal crashes with no or minimal passenger compartment intrusion. Severe injuries in such cases can usually be attributed to one or more of the following: submarining, excessive slack, inadequate mechanical compatibility between belt system compliance and mechanical properties of the chest (e.g. old age), and overloading due to backseat passenger. Frontal crashes represent the highest injury hazard, whereas underruns and ejections despite the belt exhibit the highest average injury severity. The head was found to be the most frequently severely injured body part. The SMAC procedure offers an effective tool in accident field studies.

by P. Niederer; F. Walz; U. Zollinger
Swiss Federal Inst. of Tech., University of Zurich; Institute for Biomedical Engineering; University of Zurich, Inst. for Forensic Medicine, Switzerland
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p53-93
Rept. No. SAE-770916; 1977; 34refs
Presented at the Conference, New Orleans, 19-21 Oct 1977.
Availability: In HS-021 782

HS-021 785

BELTED OR NOT BELTED: THE ONLY DIFFERENCE BETWEEN TWO MATCHED SAMPLES OF 200 CAR OCCUPANTS

Performance of the three-point safety belt in different accident configurations, especially in frontal collisions, is determined.

occupant, age, direction, and violence of impact, possible intrusion of passenger compartment, and possible overload caused by a rear seat occupant. Studies to evaluate the efficiency of safety belts of any other protection device would profit by characterizing impacts through violence parameters. Assuming it would have no purpose but to avoid ejection, the belt would cut by 23% the number of those killed in all accident configurations. In frontal impacts, the three-point safety belt cuts by 65%-70% the number of killed in 99.4% of accidents. Protection of the skull and face for belted drivers needs improvement. The critical thorax tolerance threshold is not reached, in the vast majority of cases, before a velocity change of 60 km/h and 13 to 15 g without play, and provided neither impact nor overload aggravate impact severity. Correct positioning of belts and an appropriate angle between lap belt attached to the floor and diagonal belt during impact is important. Many lesions affecting lower limbs might be avoided through rearrangement of areas under the dashboard, as in recent models.

by F. Hartemann; C. Thomas; C. Henry; J.-Y. Foret-Bruno; G. Faverjon; C. Tarriere; C. Got; A. Patel
Peugeot-Renault Assoc., Lab. of Physiology and Biomechanics, France; Raymond Poincare Hospital, Inst. of Orthopaedical Res., France
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p95-150
Rept. No. SAE-770917; 1977; 12refs
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Availability: In HS-021 782

HS-021 786

ACCIDENT AND INJURY CHARACTERISTICS IN SIDE-COLLISIONS AND PROTECTION CRITERIA IN RESPECT OF BELTED OCCUPANTS

In a study of the effects of side impacts, the accident characteristics as to impact area and intension type are analyzed and related to the resultant occupant injuries on the basis of side collisions involving 1811 passenger cars with 3064 unbelted occupants. The significance of side collisions involving passenger cars with other cars, trucks, and objects and their proportion to all side collisions with serious/fatal injuries is indicated, showing priorities of safety requirements. The injury criteria of belted occupants were investigated on the basis of 163 collisions with car side damage involving 238 belted drivers and front seat passengers. The main problems arise not so much from the limitation of the survival space because of intrusion, but from unfavorable deformation characteristics in the case of side deformation, and from not enough "deceleration path" with energy-absorbing internal structure for reduction of injury risk during the "internal impact" occupant/side area. In accidents with longitudinal direction of impact, the vehicles are often entangled in the A post area after a primary impact in the front axle area. Car-to-car crash tests should be conducted in order to determine whether by means of compatibility measures the conditions for deflection could be improved. The door area should be reinforced in the upper half of the door panel. Reduction of the risks of the internal impact include the creating of an adequate deceleration path, avoiding unfavorable deformation characteristics in the side area. No negative effects of safety belts in side impact collisions could be found.

Improvements to seat belts include shortening lock parts, pre-load device via sensors with force limitation, and a backrest which curbs side rotation.

by J. Maximilian Danner
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Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p151-211
Rept. No. SAE-770918; 1977; 13refs
Presented at the Conference, New Orleans, 19-21 Oct 1977.
Availability: In HS-021 782

HS-021 787

INJURY AGENTS AND IMPACT MECHANISMS IN FRONTAL CRASHES ABOUT 350 IN THE FIELD ACCIDENTS

A study was made of 278 cases selected by computer from 350 in-the-field frontal crashes investigated by a bidisciplinary team to determine by computer analysis the main injury-causing agents and the influence of various inner parts of the vehicle, such as instrument panel, windscreen, steering assembly, restraint system. In addition, a case-by-case analysis was made of injury-causing factors, with results of a series of three studies. Computer facilities permitted the analysis of about 80 variables for each of the 278 cases. The protection afforded by seat belts was demonstrated, as well as the dangers of incorrect seatbelt use. Laminated windshields reduce facial and eye injuries; there is a risk of injury from the steering column and wheel to head, trunk, and lower extremities. The value of the retention system is confirmed. Passenger space integrity needs to be respected as well as the danger from forward projection of rear seat passengers. Specific problems arising from seatbelt use include asymmetric retention because of the diagonal thoracic strap, and the appearance of a particular pathology for lower extremities.

by P. Bourret; S. Corbelli; C. Cavellero
Centre Hospitalier, Salon-de-Provence, France; Organisme National de Securite Routiere (ONSER), Laboratoire des Chocs et de Biomechanique, France
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p213-58
Rept. No. SAE-770919; 1977; 45p
Presented at the Conference, New Orleans, 19-21 Oct 1977.
Availability: In HS-021 782

HS-021 788

COLLISION CHARACTERISTICS AND INJURIES TO MOTORCYCLISTS AND MOPED DRIVERS

In a study of 1206 motorcycle and moped accidents with 1465 involved persons, the collision characteristics and injury risks are examined, and epidemiologic features of vehicle registration and accident involvement related to motorcycle categories are indicated. The risk exposure of motorcycles and mopeds is compared with that of cars. The injury risk in respect to motorized two-wheelers is at least 10 to 15 times higher than for car passengers. In relation to the total number of registered mopeds, moped drivers have a lower frequency of accidents. To describe the factors influencing injury risks, a new system has been developed to classify the collision characteristics by collision types, indicating the relative position of the colliding vehicles at the beginning of the crash phase and the direction

crash phases. Safety considerations in respect to cars should also include the side areas to a more intensive degree. The roof area of cars should be shaped as round as possible and not present any protruding edges. On trucks the installation of a rejection barrier in the side area should reduce the possibility of persons being projected between the front and rear axles and subsequently being run over. Injuries to drivers show characteristic differences in injury risk, when different trajectories occur. Upon a "significant change in trajectory" of the driver, caused by direct force load from the adversary car, the risk of fatal injuries is increased by four times, and of serious injuries by 1.5 times compared with "not significantly changed trajectory." Due to their lower actual speed, moped drivers undergo a "significantly changed trajectory" more often than motorcyclists when involved in a collision. Typical injury risks dependent on force load in collisions with car front or side area have been established. Safety measures in respect to motorcycles/mopeds should aim at improving the driver's trajectory and preventing direct car/body force load, above all, direct head impact, as far as possible. Possibilities of a safety conception by using a knee-bar for improving the driver's trajectory characteristic and reducing direct force load from cars on legs are proposed; this measure could be assisted by a higher seated position and prolonged motorcycle/moped wheel base.

by Klaus Langwieder
Association of German Automobile Insurers, Dept. of Automotive Engineering, (HUK-Verband), Germany
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p259-301
Rept. No. SAE-770920; 1977; 10refs
Presented at the Conference, New Orleans, 19-21 Oct 1977.
Availability: In HS-021 782

HS-021 789

HEAD IMPACT RESPONSE

A series of head impacts was conducted with 15 unembalmed cadavers to study the application of three-dimensional motion analysis using accelerometry, brain vascular system pressurization, and high speed cineradiography to the understanding of head injury mechanics. The three-dimensional accelerometry technique using nine accelerometers in three triaxial clusters was found to be applicable in direct head impacts. Analysis of the head acceleration data indicates the existence of brain motions which are relative to the motion of the skull. These motions were confirmed by the high speed cineradiographic films. Brain vascular system pressurization and time after death were found to play a role in determining the extent of the brain motions and the resulting brain injuries. The complete description of three-dimensional motion proved to be invaluable to the understanding of skull-brain kinematics.

by R. L. Stalnaker; J. W. Melvin; G. S. Nusholtz; N. M. Alem; J. B. Benson
University of Michigan, Hwy. Safety Res. Inst.
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p303-35
Rept. No. SAE-770921; 1977; 14refs
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Work sponsored by the Motor Vehicle Manufacturers Assoc.
Availability: In HS-021 782

HS-021 790

INTRACRANIAL PRESSURE DYNAMICS DURING HEAD IMPACT

Two series of cadaver head impact experiments are presented: Series I consists of individual experiments on different specimens, and Series II reports a series of multiple impacts on a single specimen. The potential use of some of the data in a linear finite element model of the brain is also demonstrated. Comparison of computed and measured brain response reveals that the brain response is highly damped; a 20% damping factor was added to the model to improve correlation. An effective bulk modulus should be used which provides some compressibility. High short duration, positive and negative pressure in the cerebrum and cerebellum are produced by inertial loading of the brain. The correlation between computed stress and intracranial pressure during impact is the same for both pressurized cadavers and live animals, indicating that the cadaver pressures are characteristic of the in vivo state. There appears to be a reasonable correlation between injury severity as determined by pathologic examination and injury severity indices; the relationship of intracranial pressure and head acceleration support the use of a linear finite element model to describe the response of the skull to blunt impact.

by Alan M. Nahum; Randall Smith; Carley C. Ward
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Grant NIOSH-RO-1-OH-00404

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Rept. No. SAE-770922; 1977; 8refs

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Availability: In HS-021 782

HS-021 791

PREDICTION OF BRAIN INJURY MEASURES FROM HEAD MOTION PARAMETERS

An analysis of experimental head impact data was performed to demonstrate that kinematic waveforms contain information relating to head and brain injuries, and that analysis techniques exist which can properly exploit this information to create injury predictive functions. An experimental data base consisting of 26 monkey head impacts was utilized. Translational and rotational acceleration time histories of the head were available. Parameters computed from these kinematic waveforms were the input variables to an analysis technique. The output, or modeled, variable was the experimentalist's evaluation of the severity of injuries. Greater momentum transfer contributed to high abbreviated injury scale (AIS) values. High average translational velocity and large maximum translational acceleration contributed to unconsciousness AIS. As more angular motion was introduced relative to translational motion, longer times of unconsciousness resulted. Translational acceleration also contributed to the duration of

unconsciousness. It is possible to accurately model head and brain injury assessments from strictly head motion parameters.

by Anthony N. Mucciardi; John D. Sanders; Rolf H. Eppinger
Adaptronics, Inc.; National Hwy. Traffic Safety
Administration

Contract DOT-HS-4-00882

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(21st) Proceedings," Warrendale, Pa., 1977 p367-415

Rept. No. SAE-770923; 1977; 15refs

Presented at the Conference, New Orleans, 19-21 Oct 1977.

Availability: In HS-021 782

HS-021 792

DYNAMIC CHARACTERISTICS OF HUMAN LEG JOINTS

An analysis is made of the reaction forces and torques of the leg joints during a simulated car crash. The test apparatus utilized a fixed torso, but the toeboard moved rapidly toward the test subject to simulate leg flexure. A detailed two-dimensional force measuring system permitted computation of forces and torques at the leg joints. Static and dynamic values of force and torque are presented as a function of the joint angle. The results are generally uniform with many of the curves assuming a parabolic shape. Peak dynamic values were twice the level of the static counterparts. The static reaction force results were less than reported by previous investigators. Modifications to the seat and toeboard orientation or seat comfort could produce higher force levels. A dynamic experiment performed at the test configuration yielding maximum static forces should be considered for future work. The effect of increased toeboard velocity should be analyzed to determine if the positive correlation of velocity and joint characteristics is valid at higher levels.

by Stephen L. Gordon; Philip N. Ortlicke; James Prince;
Robert R. McMeekin

National Hwy. Traffic Safety Administration, Safety Res.
Lab.; Armed Forces Inst. of Pathology, Aerospace Pathology
Div.

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(21st) Proceedings," Warrendale, Pa., 1977 p417-41

Rept. No. SAE-770924; 1977; 17refs

Presented at the Conference, New Orleans, 19-21 Oct 1977.

Availability: In HS-021 782

HS-021 793

CONSIDERATIONS FOR A FEMUR INJURY CRITERION

A femur fracture injury criterion is presented that assesses the dependence of the permissible human knee load on the duration of the primary force exposure. Currently a constant allowable femur load limit of 7.6 kN (1700 lb) is specified in Federal Motor Vehicle Safety Standard (FMVSS) 208, but recently the Federal Government proposed elevating the allowable limit to 10.0 kN (2250 lb), which is in excess of the limited experimental average static femur fracture force of 8.90 kN (2000 lb). A general analysis of all the available biomechanics data and mathematical models on femoral impact response and fracture indicates a significant load time dependence for primary pulse durations below 20 ms that can elevate the permissible femur load above the federally proposed allowable limit of 10.0 kN (2250 lb). A femur injury criterion was therefore formulated that is consistent with the

available experimental data, incorporates the temporal characteristics of the femur fracture force and provides a technically feasible and improved protective test standard for car occupant safety evaluations. Dynamic differences between the femoral response of the human cadaver and the Part 572 dummy were subsequently quantified to substantiate the efficacy of applying the Femur Injury Criterion to the measured response of the Part 572 dummy.

by David C. Viano
General Motors Res. Labs., Biomedical Science Dept.
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p443-73
Rept. No. SAE-770925; 1977; 11refs
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Availability: In HS-021 782

HS-021 794

STEREORADIOGRAPHIC MEASUREMENTS FOR ANATOMICALLY MOUNTED INSTRUMENTS

A stereographic technique is described in which two simultaneous X-ray exposures of an instrumented subject are prepared and analyzed, yielding a complete six-parameter statement of the position and orientation of the instrument package relative to a coordinate system fixed in the subject's bony anatomy. A description of the radiologic equipment is included as well as details of those devices developed especially for stereoradiographic exposure and system calibration. The analytical aspects of the technique are discussed in qualitative terms in the body of the paper, leaving more rigorous treatments to five appendices. The technique is concluded to be a practical means of determining the geometrical relationships between subject mounted instrumentation and the bony anatomy of two mounting sites, the head and the first thoracic vertebral body. Although practical limitations on the technique require a departure from the coordinates called for at the second site, the alternative system appears to be nearly identical and is the best approximation available within the limitations of working with human volunteer subjects.

by E. Becker
Naval Aerospace Medical Res. Lab. Detachment
Publ: HS-021 782 (SAE-P-73), "Stapp Car Crash Conference (21st) Proceedings," Warrendale, Pa., 1977 p475-505
Rept. No. SAE-770926; 1977; 4refs
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Availability: In HS-021 782

HS-021 795

MEASUREMENT OF HEAD, T1, AND PELVIC RESPONSE TO -GX IMPACT ACCELERATION

In order to describe accurately the inertial response of human subjects to impact acceleration, it is necessary to measure the pelvic response as well as the response of the head and first thoracic vertebra (T1). A pelvic anatomical mount has been constructed and used on one volunteer undergoing successively higher levels of -Gx impact acceleration. The description of the use of the mount is given. The data for four runs in a maximum rate of onset and maximum duration configuration from 2 through 7 G peak acceleration are reported. Data from this subject for -Gx impact acceleration experiments have been previously reported and are compared to data from the experi-

ments with the pelvic mount. The propagation of the acceleration profile from pelvis to T1 to the head is described, and the use of these data for description of the complete dynamic response of man is discussed. Conclusions are that use of the pelvic mount as an integrated portion of the restraint system does not significantly change the response at T1 and consequently the head. The response of the restrained pelvis and T1 shows a delay of the peak acceleration from chair to pelvis to T1 which seems to increase with increasing acceleration. The pelvic acceleration approximates the chair acceleration with some dynamically induced differences as expected since the restraint straps permit some small motion. T1 acceleration differs from the chair and pelvic acceleration to a larger degree. These major dynamic differences are due to relatively larger motion of T1 permitted by the restraint system and chest deformation. The unrestrained head responds primarily by rotation of the head and neck system and is markedly different from T1 or pelvis.

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HS-021 796

DYNAMIC RESPONSE OF THE HUMAN HEAD AND NECK TO 0GY IMPACT ACCELERATION

The effect of sled profile parameters (peak sled acceleration, onset and duration) on the dynamic response of the head and neck for 0Gy acceleration profiles is studied and results are compared with the similar study for the -Gx data base. A series of human volunteer experiments was conducted to measure the inertial response of the head and first thoracic vertebra (T1) to 0Gy whole body impact acceleration. The accelerometer, instrumentation system, and procedures were identical to those used for measuring response to -Gx impact acceleration, previously reported. Three categories of sled acceleration profile were used: high onset, long duration from 2 G to 7.5 G with end stroke sled velocity limit of 6.5 meters/sec; low onset, long duration with the same peak acceleration and velocity limits; and high onset, short duration from 5 G to 11 G. Comparison time profiles of angular acceleration, angular velocity, and linear resultant acceleration at the head anatomical origin and horizontal linear acceleration at the T1 origin are presented at selected peak sled acceleration levels for five subjects of various anthropometric dimensions. Statistical and analytical modeling are compared with similar efforts for previously reported -Gx experiments. The increased head angular acceleration in the 0Gy runs relative to the -Gx runs is due to the increased peak acceleration at T1 for the same sled acceleration. This increased T1 linear acceleration is undoubtedly due to the different restraint employed with the 0Gy runs. With either 0Gy or -Gx runs, the first peak value of T1 horizontal acceleration determines the peak angular acceleration of the head. Head angular acceleration can be predicted from the combined effects of peak sled acceleration and duration. However, this conclusion is strictly limited to the specific restraint and utilization of the restraint by the staff conducting the experiments. The pattern of the time profiles for the output variables for 0Gy runs is similar to that for the -

Gx data base. However, the relative magnitude of the angular deceleration peak (second peak) to the acceleration peak (first peak) is greater for 0Gy than for -Gx runs. The head angular velocity for the long duration conditions (HOLD and LOLD) is not a significantly different function of the peak T1 horizontal linear acceleration for the 0Gy and -Gx data bases. The head angular velocity for the short duration condition (HOSD) is less for both 0Gy and -Gx data bases. The major determinant on peak head angular velocity in both the 0Gy and the -Gx studies is the peak T1 horizontal acceleration with a secondary effect due to duration. The head linear resultant acceleration is approximately the same function of peak T1 linear acceleration for conditions HOLD and LOLD in both 0Gy and -Gx runs. The head linear acceleration is significantly less for the short duration condition (HOSD) with the effect of duration more pronounced in the 0Gy than in the -Gx runs. For the 0Gy runs, the head rotates around an axis with a fixed orientation in the mid-sagittal plane approximately normal to the neck line defined as a line between the T1 anatomical origin and the head anatomical origin. Incorporating this constraint into a 0Gy head/neck model should greatly simplify modeling efforts.

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HS-021 797

COMPARATIVE THORACIC IMPACT RESPONSE OF LIVING AND SACRIFICED PORCINE SIBLINGS

Thoracic impact response and injuries of living and postmortem porcine siblings were investigated to quantify comparative differences. Thirteen male animals, averaging 61.4 kg, from five different porcine litters comprised the two animal samples. Porcine brothers were subjected to similar impact exposures for which at least one brother was tested live, anesthetized and another dead, post rigor with vascular reperfusion. Statistically significant differences in biomechanical responses and injuries were observed between live and postmortem siblings. On the average the anesthetized live animals demonstrated a greater thoracic compliance, as measured by increased normalized total deflections (21% H), and reduced overall injuries (abbreviated injury scale or AIS 14% Lo and rib fractures 26% Lo) at lower peak force levels (13% Lo) than did the postmortem subjects. However, individual comparisons of "match-tested" siblings demonstrated very similar responses in some cases. The living animals developed myocardial conductive system disfunctions encompassing arrhythmias, blocks, and ventricular fibrillation which were poorly correlated to gross autopsy findings of heart trauma and the overall AIS. Arterial overpressures were substantially higher (three times) in the postmortem animals indicating that the experimental protocol produced an unrealistic arterial system impact response. A procedure is suggested which uses the live vs. postmortem animal response and injury data to revise an exist-

ing injury vs. normalized deflection relationship based upon human cadaver data.

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HS-021 798

BIOCHEMICAL EXPERIMENTS WITH ANIMALS ON ABDOMINAL TOLERANCE LEVELS

For a series of impact tests of the effects of rear end collisions, a special rear end configuration was developed for the Porsche 911. Typical sequences of movements were determined during impact tests in which dummies were hit by various rear end variants. To find out whether under real traffic situations and in a speed range of 16 through 24 km/h this type of collision results in intra-abdominal injuries, 12 corresponding test series with Gottingen minipigs were conducted in which the test animals were projected against various rear end variants. Measurements were made to determine the forces and accelerations acting on the respective rear ends. Acceleration to which the animal was subjected was measured by means of an acceleration sensor sutured to the test subject's back; in addition, the point of impact on the animal's body was determined. Dissection and microscopic examination of the internal organs followed immediately on the test. When impacting against a flexible rear end structure of a mass of 8.5 kg the limit between abbreviated injury scale (AIS) grades 3 and 4 is located at approximately 1471.5 N for a duration of up to 5 ms. Under the given test conditions the tolerance limit between a subacute and an acute shock is at approximately 981 N for a duration of up to 20 ms. When hitting against non-flexible structures, the abdominal region incurred particularly severe injuries, which in two cases were only insufficiently recorded due to the monoaxial force measurement. With certain restrictions, the results obtained may be applied to an 8 to 12 year old child.

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HS-021 799

DYNAMIC RESPONSE OF HUMAN BODY SEATED ON A TRACTOR AND EFFECTIVENESS OF SUSPENSION SYSTEMS

High amplitude vibrations, in the 0.5 - 11 Hz frequency range, are found to be harmful to tractor drivers; vertical and pitch vibrations of the tractor-human occupant system are analyzed. The aim is to determine the parameters and effectiveness of standard type suspension systems (provided to both seat and front axle and to seat only) so that the response of the human

than the other type and effective in reducing vertical and pitch vibration levels by 60% and 85% respectively, thus improving ride comfort.

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HS-021 800

NECESSITIES AND POSSIBILITIES OF IMPROVING THE PROTECTIVE EFFECT OF THREE-POINT SEAT BELTS

In the second phase of a research program covering more than 100 catapult-simulated frontal collisions at an impact speed of 50 km/h, investigation was made of the possibility of improving the protective effect of the safety belt, either by an integrated seatbelt system, a pyrotechnic preload device, or hydraulic load-limiting elements. With the three-point seatbelt systems, studies were made of the effect of varying locations of the anchorage points, the influence of body size, seat adjustment, and seating position, the influence of seat stiffness and belt slack. Integrated seatbelt systems are recommended, in which all elements of the restraint system are fixed to the seat. Optimum belt design can be achieved not only for persons of average size and weight, but also for those of particularly small size and low weight as well as for tall and heavy persons.

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HS-021 801

SMALL CAR ASPIRATOR AIR BAG RESTRAINT

Development of an aspirator air bag through computer simulations and sled tests has been completed, and an evaluation made in a 41.6 mph crash of a standard Volvo into a flat barrier. The evaluation included both out-of-position and normally seated occupants. Conclusions are presented first with regard to specific design considerations of the aspirator system and second with regard to the effectiveness of the system toward passenger injury control. Pressure records and high speed film data established that the system aspirated effectively, drawing in ambient air to supplement the stored gas generated. The air bag barely inflated with the aspirator flaps sealed, but became fully inflated under conditions of full aspiration. Sled tests produced data which satisfied injury criteria for the full range of adult dummy sizes up to the 45 mph crash speed range. The

system should also provide a much safer crash environment for a small child than if the child were unrestrained.

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Contract DOT-HS-5-01254
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HS-021 802

VOLKSWAGEN'S PASSIVE SEAT BELT/KNEE BOLSTER RESTRAINT, VWRA: A PRELIMINARY FIELD PERFORMANCE EVALUATION

Results are presented of the field accident performance of the VW Passive Restraint System (VWRA) installed in Rabbit vehicles operating on U.S. highways. The historical development of the VWRA as an outgrowth of VW's research and development programs is detailed for perspective. To act as a baseline, dynamic sled and full-scale barrier crash testing with instrumented surrogates using the VWRA are presented. Collected and calculated data are given from VW's field investigations which have been in progress over the last two years. In the 59 accidents, there were four serious injuries but no fatalities and no injuries of abbreviated injury scale (AIS) 5. Distribution between passengers and drivers is similar to comparable accident injury studies. Injuries are diagnosed according to body region. The inner and lower end of the torso belt may restrain the pelvis in opposite corner and side impacts. Abdominal injuries were uncommon. The more significant chest/abdomen injuries were due to contact with the lower rim of the steering wheel. Calibration of collision severity by delta V is superior as a descriptor but difficult to accurately define; calibration by repair costs is easily quantifiable but lacking in accuracy. The Fatal Accident Reporting System (FARS) has also been searched without finding a front seat fatality with the torso belt in position.

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HS-021 803

EVALUATION METHODS FOR THE BIOMECHANICAL QUALITY OF RESTRAINT SYSTEMS DURING FRONTAL IMPACT

An analysis is made of the deficiencies of data and criteria in biomechanical research. Additional criteria are proposed as significant for a better overall evaluation of restraint devices considering biomechanical facts: a torso-angle criterion plus a criterion for vertical displacement. As a result of a dummy-crash-series, an analysis is made of correlations between the newly defined and the former criteria. Two characteristic types of motion sequences are carried out, evaluated, and compared. With this technique, only measurements and evaluations of simple, primary and reproducible values from a high-speed film or electronic measurements are necessary.

Only by use of additional motion sequence criteria can overall evaluation of the biomechanical quality of restraint systems be possible in dummy tests and not only in cadaver tests.

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HS-021 804

GEOMETRIC, INERTIAL, AND JOINT CHARACTERISTICS OF TWO PART 572 DUMMIES FOR OCCUPANT MODELING

The geometric, inertial, and joint characteristics of two Part 572 crash test dummies were measured to provide input to the Motor Vehicle Manufacturers Assoc. (MVMA) two-dimensional occupant model. Segments of the dummies were defined which correspond to the links of the model and coordinate axes were defined for each segment. The center of gravity of each segment was located and its coordinates were measured along with the locations of joint centers, instrument mounts, and other significant geometric features. The mass moment of inertia for each segment about a lateral axis through its center of gravity was measured. The geometric and inertial measurements are presented on summary sheets for each segment with the hardware definition, coordinate system, and special notes for that particular segment. These summary sheets present the data in a format that is readily usable for defining computer model input. The resistance to motion of the elbows, shoulders, hips, and knees of the two dummies was measured and interpreted for input to the MVMA two-dimensional model.

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HS-021 805

HYBRID III--A BIOMECHANICALLY-BASED CRASH TEST DUMMY

Hybrid III is an experimental test dummy with component dynamic responses which approximate available biomechanics data, based on the anthropomorphic test dummy (ATD) 502 dummy developed in 1973 by General Motors. It features a biomechanically based head design, humanlike automotive seating posture, constant torque primary joints, and detailed documentation for fabrication. Hybrid III uniquely features a biomechanically based neck, thorax, and knee covering. Transducers for measurement of neck loads and chest deflection are integral parts of the design. Though a measurable improvement over the present "standard" dummy (Part 572) in terms of component responses in frontal impacts, Hybrid III is not the ultimate test dummy. It does not, for example, provide substantial biofidelity improvements for lateral impacts. The design and test results for three prototype dummies are presented. Dynamic responses, relative to human cadaver and

knee components. Performance of the Part 572 dummy is also presented for comparison. An evaluation of whole dummy repeatability and reproducibility during Hyge sled tests is described; Hybrid III and Part 572 dummy performances are compared, and additional work outlined. It is concluded that Hybrid III component responses are significantly closer to biomechanics data than those of the Part 572 dummy. The three prototypes are as repeatable as the Part 572 dummy and significantly more reproducible.

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HS-021 806

RESPONSE COMPARISONS OF THE HUMAN CADAVER KNEE AND A PART 572 DUMMY KNEE TO IMPACTS BY CRUSHABLE MATERIALS

A program was initiated to determine the response of the human knee during impact with a deformable material. Knees of 13 unembalmed human cadavers and a Part 572 dummy were impacted with a pendulum having either 203 mm square aluminum honeycomb or Styrofoam DB striking surface. Impacts were made along the femoral axis of rigidly mounted legs with a 52.3 kg pendulum at velocities of 1.8 and 3.6 m/s. Forces transmitted through the femur and tibia (at the ankle) were measured to determine the force response distribution. Pendulum acceleration parallel to the femoral axis was measured for all tests. Knee penetrations into the striking surface material were obtained by double integration of the pendulum acceleration-time traces, were verified by analysis of high speed movies, and compared with the projected contact areas as penetration increased. Impact responses are presented as crossplots of force vs. depth of knee penetration into the interface material. For aluminum honeycomb impacts at 3.6 m/s, the mean peak force resulting from cadaver impacts is lower than the mean peak force resulting from dummy knee impacts. However, for Styrofoam DB impacts at 3.6 m/s, the mean force-penetration response of the cadaver knees is similar to the response of the Part 572 dummy knee. Significant differences in peak force levels for the cadaver and dummy were not observed with either aluminum honeycomb or with Styrofoam DB at 1.8 m/s impact velocities.

by William E. Hering; Lawrence M. Patrick

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HS-021 809

AN ANALYSIS OF BAC DATA FOR DRIVERS FATALLY INJURED

A study of driver fatalities in the area of operation (Portland and Lane County) of the Oregon Alcohol Safety Action Proj. (ASAP) relates blood alcohol concentration (BAC) to demo-

ferences were found in the BAC distribution by time of day or day of week. There were significant differences in average BAC of the various age groups: the 26-30 years group had the highest average (.151), and those for the age groups 14-20, 51-60, and 61 and over were significantly lower. Differences between sexes in BAC distribution did not statistically differ. The profile of the typical deceased driver includes the following characteristics: male, 36 years old, driving for 12 years, and having a previous traffic citation such as for driving too fast for road conditions. About one third of the 74 driver fatalities studied were legally intoxicated; 28% had a police record for other than traffic convictions, and about half had had at least one previous accident. The statistical test performed for the deceased driver profile indicated that BAC at death is positively associated with previous accident, police records, and previous convictions for driving while intoxicated: at death, the average BAC for deceased drivers with previous accidents was .10 compared with .039 for those without previous accidents, the average BAC at death for drivers with police records was .143 versus .042 for those without police records, and the average BAC of drivers with DWI convictions was .21, more than four times greater than of those without convictions. There was no change in trend of either the number of deceased drinking drivers or BAC distribution. Neither was there any significant difference in mean BAC between the two ASAP areas, only one of which (Portland) had special enforcement patrols, or in mean BAC of driver fatalities before or after the project period.

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Grant NIH-RR-3
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Availability: Reference copy only

HS-021 810

AN ANALYSIS OF ASAP PATROL ACTIVITY

The Oregon Alcohol Safety Action Proj. (ASAP) in Portland involved use of special enforcement patrols made up of members of the Portland Traffic Div. who were specially trained in use of breathalyzer equipment and arrest techniques, and assigned to weekend night duty. One officer in each of eight patrol cars concentrated on major arterials and the vicinity of bars and nightclubs on Friday and Saturday nights, pulling over suspiciously operated vehicles to search for signs of alcohol. Computer-generated maps of nonaccident arrests for driving while under the influence (DUIL) showed that such arrests are concentrated within subareas of the eight patrol districts, in which regular patrols were less concentrated than special patrols. The ASAP patrols have decided to favor patrol of areas of serious alcohol-related accidents. Precise evaluation of this method was impossible, however, due to insufficient data and programming time. Injury and fatal accident data, excluding pedestrians, used to test for the number of accidents reduced by ASAP patrols yielded no significant results for fatalities but a reduction in injury accidents. There has not been a consistent improvement in the efficiency of the ASAP patrols in terms of time needed per arrest. As for those arrested, reliable data on license record and occupational level are not available, but age and accident occurrence seem to be important variables. Arrests for DUIL for regular patrols has increased to about twice the preASAP rate. Plea bargaining increased. Probation officers had to spend all their time on presentence investigations, resulting in inadequate probation

monitoring and subsequent increased parole violations. Public opinion surveys indicated that 90% of the general population perceived a higher risk of arrest after the project period.

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HS-021 811

AN ANALYSIS OF THE JUDICIAL DISPOSITION OF ALCOHOL-RELATED TRAFFIC ARRESTS

Disposition of alcohol-related traffic arrests during the operational period of the Portland, Oreg., Alcohol Safety Action Proj. (ASAP) was as follows: 30.2% guilty pleas to driving under the influence of liquor (DUIL); 1.5% guilty pleas to substituted, nonalcohol-related charges; 0.7% guilty pleas stipulated to facts; 2% dismissed; and 65.7% not guilty pleas. Of those pleading not guilty, 90.6% requested jury trials; most such requests were dropped. Of those who pleaded not guilty, 61.2% changed their pleas. Of all alcohol-related cases arraigned, 21.9% were carried through to trial with not guilty pleas. Prosecutors attempted to schedule stronger cases near the beginning of a jury term and weaker cases toward the end in order to have the best possible chances for conviction. ASAP provided expert witnesses to explain blood alcohol concentration (BAC), but the prosecution did not rely on them heavily. Presentence investigations were made in 81.5% of convictions. As for sentencing, judges almost always followed the recommendations of the Parole and Probation Dept. and the Alcohol and Drug Section; education and treatment were combined with sentences. There were increases in the percentage of convictions with required treatment, convictions involving jail and fines, convictions involving probation, plea bargaining, referrals to Alcohol Information School, and referrals to the Detoxification Center. BAC's for all disposition groups except dismissals dropped significantly. BAC distributions differed significantly between disposition groups both before and during ASAP. There was an increase of females disposed as guilty during the ASAP period. There was a substantial increase in processing time, due mainly to presentence investigations but also to increased requests for jury trials. Within the judicial system, a completely separate processing channel limited to alcohol-related traffic offenses was created; it merged with the system as a whole after 1 Jan 1973. More and better treatment facilities were created as a result of ASAP.

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Oregon Problem Drinker-Traffic Fatality Proj., Oregon State
Div. of Mental Health; Oregon Res. Inst.
Grant NIH-RR-3
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HS-021 812

AN ANALYSIS OF PROBLEM DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

The judicial and rehabilitation systems of the Oregon Alcohol Safety Action Proj. (ASAP) involved ASAP-funded trials and presentence investigations, followed by serving jail terms and

those not in a control group) described in the Alcohol and Drug Clinic and some form of treatment. Treatment options included Antabuse, Antabuse with therapy, therapy only, and Alcoholics Anonymous. Most were assigned to ASAP unless their cases were so weak that plea bargaining was allowed or unless they did not live within easy driving distance of an ASAP facility. One third of the persons diagnosed in the first phase of diagnosis were considered to be suspected problem drinkers; of these, five sixths were confirmed as such in the second stage of diagnosis. Decision as to which type of treatment to give to an individual was based on the attitude and situation of the individual, e.g. Antabuse for the more difficult cases or Alcoholics Anonymous for the religious. Judges have accepted the importance of problem-drinker diagnosis. ASAP has increased case handling time and has overlooked project monitors which weakened the credibility of the problem system. Average cost per drinker diagnosis was \$57.47; average referral cost was \$73.29. Of 601 persons classified as problem drinkers, 171 were assigned to a control group. Presence investigations began with background investigations to gather demographic data.

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Div. of Mental Health; Oregon Res. Inst.
Grant NIH-RR-3
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HS-021 813

AN ANALYSIS OF ALCOHOL SAFETY SCHOOLS

The clinic run by the Portland, Oreg., Alcohol Safety Action Proj. (ASAP) for those who abuse alcohol and drugs provided a five-week program for court referrals. Clients were diagnosed either as having a drinking problem or not; those not were referred back to the court for regular sentencing and attendance at Alcohol Information School; those who did were placed in a control group (for court sentencing) or were sentenced and then assigned to prolonged educational treatment following serving of the sentences. The four major treatment modes were Antabuse, Antabuse with therapy, therapy only, and Alcoholics Anonymous. Data on differences between treatment groups are not yet available. Driver profile data are tabulated; some characteristic features include the following: male; age 30-54; and married or divorced rather than single. The principal positive impact of ASAP on the court system was acceptance by judges of the importance of problem-drinker diagnosis. Negative effects were increased handling time per case and overloading of probation monitors, which weakened the credibility of the probation monitors. Samples of handouts given to clients are appended.

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Div. of Mental Health; Oregon Res. Inst.
Grant NIH-RR-3
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AN ANALYSIS OF BAC DISTRIBUTION IN THE DRIVING POPULATION: THE ROADSIDE SURVEYS

The effects of the Portland, Oreg., Alcohol Safety Action Proj. (ASAP) on blood alcohol concentrations (BAC's) of drivers were studied by roadside surveys made Apr 1971, May 1972, and Apr 1973, on Friday and Saturday nights. Both questionnaires and breath samples were included. The first two surveys are analyzed in detail, whereas only preliminary results are presented for the third. The survey means of BAC's for the first and third surveys were the same, while the second survey mean was significantly lower. With widespread emphasis on patrol enforcement, it is impossible to attribute the changes to any one aspect of ASAP, or to the failure of any activity to alter drinking and driving patterns. Appended data include the following: for the first survey, detailed statistical considerations and by-site breakdown, and sample interview form; and for all three surveys, sample survey material.

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Div. of Mental Health; Oregon Res. Inst.
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HS-021 815

AN ANALYSIS OF ATTITUDES AND AWARENESS OF ASAP: HOUSEHOLD SURVEYS

Random household surveys made in Nov 1970 and Dec 1972 gathered data on attitudes toward alcohol and highway safety, in order to measure the impact of the Oregon Alcohol Safety Action Proj. (ASAP). Attitudes toward alcoholism, alcoholics, drinking and driving, and the role of government were measured in Eugene-Springfield, Salem, and Portland in a random sampling plan. Sample size was 1598 in 1970 and 1000 in 1972. There were positive attitudinal changes, particularly in Portland, Salem, which had no direct public information activity, showed more support in attitudes toward alcoholics at the end of the project, but less in other areas. Raw mean scale scores are tabulated, and the interview schedules are appended.

by B. H. Bronfman
Oregon Problem Drinker-Traffic Fatality Proj., Oregon State
Div. of Mental Health; Oregon Res. Inst.
Grant NIH-RR-3
Rept. No. Final-Analytic-Study-8-1973; 1973; 69p
Subcontracted to Oregon Res. Inst.
Availability: Reference copy only

HS-021 816

PUBLIC INFORMATION AND EDUCATION SUMMARY

Oregon's Alcohol Safety Action Proj. (ASAP) conducted an evaluation of its public information and education activities. Review of media information available in 1970 showed that such information was scarce, poorly designed, inaccurate, and generally of poor production quality. Plans to have TV and radio spots aired at times suitable for the target audience proved difficult to implement; such public service spots were

to debunk various myths concerning alcohol impairment, then to educate about ASAP programs, and the meaning of blood alcohol concentration (BAC). Roadside and household surveys before and after the campaign showed the campaign to have been successful. Liquor-store patrons were one of the specific target audiences. Efforts to educate members of the news media in small conference meetings were not particularly successful; personal contacts were somewhat more successful but took much effort and time. An effort to educate school children and teachers never became operational, since the copy proposed by the agency was rejected by the Regional Contract Manager. Results of a personal correspondence program with such community leaders and opinion makers as attorneys, physicians, and the news media can only be surmised, since no follow-up was made. It is doubtful whether a master campaign program suitable for any area can be derived. Those aspects of the campaign which do have universal validity, however, include technical copy written for a brochure on the effects of mixing drugs and alcohol, a BAC calculator, and the one-camera, low-cost technique of producing TV spots. Seeking public service time for TV and radio spots is quite inefficient: it is recommended that time be bought, and that a budget of 5% of total funds is not unreasonable. Other educational campaigns were planned by the Oregon Liquor Control Commission and the Oregon Restaurant and Beverage Assoc. The various radio and TV announcements, written materials, direct mail letters, BAC calculator, and related materials are appended.

by John F. Williams, Jr.
Oregon Alcohol Safety Action Proj., Oregon State Div. of
Mental Health; 619 Henry Bldg., 309 S.W. Fourth Ave.,
Portland Ore. 97204; Williams Advertising Agency
Rept. No. Final-Analytic-Study-11-1973; 1973; 158p
Operational summary, 1970-1973. Subcontracted to Williams
Advertising Agency.
Availability: Reference copy only

HS-021 817

HIGH SCHOOL EDUCATION PROJECT EVALUATION

The Oregon Problem Drinker-Traffic Fatality Proj. designed, tested, and evaluated a four-session instructional unit to teach to driver education students in high schools. The materials explore why people drink and drive irresponsibly, and promote the identification of responsible alternative behaviors. The influences of emotional states and attitudes on drinking and driving are emphasized. The materials consist of an abstract, three-segment film portraying loneliness, stress, and anger; two student handouts covering factual information; a teacher's manual focusing on the combination of knowledge and attitude; a set of six transparencies; and an attitude survey, test on alcohol and drinking and driving, and a unit evaluation form. Teachers were interviewed about their feelings toward alcohol and were trained in a special session emphasizing attitudes toward alcohol. The materials were field-tested with over 1500 junior and senior high school students in two metropolitan areas. They were used in social studies, science, health, psychology, and home room classes as well as in driver education classes. It was shown that the affective/attitudinal approach was most successful with junior high school students, with females, and with students whose teachers had a negative attitude toward drinking. The time allotted for instruction should be greatly increased, to perhaps four to six

Student Handout 2 should give a better explanation of the affective/attitudinal approach and its objectives; other print materials were satisfactory. Teachers should have a reassessment session following presentation of the unit. The unit materials and evaluation forms and data are appended.

by Helen L. K. Farr; Sherrill L. Whittemore
Oregon Alcohol Safety Action Proj., Oregon State Div. of
Mental Health; Oregon State System of Higher Education,
Teaching Res. Div., Monmouth, Ore.
Rept. No. Final-Analytic-Study-10-1973; 1973; 142p
Subcontracted to Oregon State System of Higher Education.
Availability: Reference copy only

HS-021 818

MOTOR VEHICLE DIVISION COUNTERMEASURES: PREDICTION SCALE PROGRAM, DRINKING DRIVER REEXAMINATION PROGRAM

A prediction scale to detect the potential drunk driver before an arrest for driving while intoxicated (DUIL) was statistically developed from a comparison of data on driving and criminal records of those who had never had such offenses on their records with the pre-arrest records of those who did. Multiple regression and automatic interaction detector programs were used, as was the INFORM-9 technique. Statistical data are tabulated, as well as predictor variables according to pooled and two-stage analysis by AID, MULTR, and INFORM-9, and according to the Bayesian approach. Using driving record data, certain types of convictions were shown to be more common, proportionally, for one population than for the other. The seven most indicative variables were charted by age group. For all age groups combined, the first seven variables were the following: reckless driving, total accidents, no operator's or chauffeur's license, age, and accident-stopped. Using both driving and criminal record data, frequency distributions for each variable were again obtained, both for each age group separately and also for all ages pooled. The predictive values of MULTR, AID, and INFORM-9 were compared. The ten split AID analysis yielded the lowest total type i and type ii errors when projected back upon the cross-validation sample. The INFORM-9 technique provided over 70% accuracy based on three variables only. When AID was reevaluated using five splits, results in type i and type ii errors were nearly identical to those for INFORM-9 using the three variables. MULTR, employing six variables, was not effective as a prediction model. In the reexamination program, the records of a consecutive sample of 500 convicted second offenders were tracked for the one-year suspension interval and the year following. Comparison of the suspension-year and the post-suspension-year driving records of the reexamined and reinstated group with those of the reinstated but not reexamined group revealed only slight differences during either year. It was not possible to assess adequately the merits of the reexamination procedures on the basis of these statistical data.

by Noel Kaestner
Oregon Alcohol Safety Action Proj., Oregon State Div. of
Mental Health
Rept. No. Final-Analytic-Study-9-1973; 1973; 45p
Availability: Reference copy only

HS-021 819

PHOENIX ALCOHOL SAFETY ACTION PROJECT. BASELINE TABLES

Tabulated, quarterly data from the Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) for the baseline years include the following: for both Phoenix and for the control city of Tucson, Ariz., 1969-1971, fatal and injury crashes in the categories single-vehicle, multivehicle, and pedestrian and broken down by time of day and day of week; for Phoenix, blood alcohol concentration (BAC) data for driver fatalities, and for drivers arrested for alcohol-related offenses in 1970-1971 only; for Phoenix, 1971 data on enforcement patrol activity by time of day; and partial data on judicial disposition of alcohol-related arrests, Phoenix, 1971.

Phoenix Alcohol Safety Action Proj., Ariz.

1973; 21p

Equivalent to Appendix H Tables of other ASAP reports.

Availability: Reference copy only

HS-021 820

EVALUATION OF THE PHOENIX ALCOHOL SAFETY ACTION PROJECT. THIRD QUARTER, 1972

During the third quarter, 1972, operations of the Phoenix, Ariz., Alcohol Safety Action Proj. there were decreases in total crashes and in total alcohol-related crashes, particularly those involving injury. Ratio of savings to cost is 3.57 based on an average of 1.5 injuries per injury crash, or 2.25 based on one injury per injury crash. Of the 2651 arrests made for driving while intoxicated (DWI), 590 were made by ASAP patrols. A statistical profile of the average individual arrested for DWI is tabulated. A total of 2052 cases were concluded, of which 39% pleaded guilty, 39% received a change of plea, and 21% who pleaded not guilty were found guilty. Guilty pleas decreased 5% relative to third quarter 1972. The Diagnostic Review Board screened 1398 DWI's, of which 336 were classified as problem drinkers and 442 as potential problem drinkers. The percentage of DWI's classed as problem drinking drivers (PDD), relative to week of arrest, decreased over time. The Crisis Intervention Center received 412 calls, with the number steadily increasing: most were from police and from hospital referrals. The Transportation Assistance program received 218 calls, which resulted in 2366 miles of transportation. There were 1398 individuals assigned to the DWI schools; 1067 actually attended or received literature. There were 1150 TV and radio spots, 16 special TV and radio programs, 120 minutes of special programs, and 28 appearances of individuals from the speaker's bureau. There were 486 column inches of newspaper copy and photographs, with one story on the front page. It is estimated that one million people were reached by the public information effort. There was no cost for the publicity.

by William E. Lewis; Victor E. Rothe; Dwayne A. Rollier; Ray Greenway; Jan Weinheimer; Christie Burdick; Nancy Mills; Hcw H. Young
Phoenix Alcohol Safety Action Proj., Ariz.; Arizona State Univ., Evaluation Res. Team
1973; 173p

Availability: Reference copy only

HS-021 821

SITE REPORT. PHOENIX, ARIZONA

A background study of the operational area of the Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) considers the following: general site information; the legal provisions of implied consent, prohibition of driving while intoxicated (DWI), presumptive limits, and statutory penalties; the State Motor Vehicle Agency; interagency relationships; courts and judicial procedures; the Phoenix Police Dept.; the Arizona Hwy. Patrol; and accident and enforcement statistics. The law prohibiting DWI includes "physical custody" of a vehicle within its sanction. The presumptive limit is .15%; it is recommended that it be lowered to .10%. Drivers' license records files should be automated. Those having alcohol-related offenses or who have a history of alcoholism and who have valid licenses should be identified, and the alcoholics should be required to take medical examinations. Court computer facilities should be expanded to handle the increased workload. The Phoenix DWI course should be continued as a means of treating the drunk driver offender. Fingerprinting of all alcohol-related offenders should be considered. There should be improvement in the use of computer data to permit more effective, selective enforcement analysis. Specific blocks of instruction for officers should be established. Selective enforcement data would help the law enforcement department to respond to the problem of the DWI. ASAP's expansion to include all law enforcement agencies should be considered.

Alcohol Safety Action Prog., Hwy. Safety Div., Phoenix, Ariz. (n.d.); 42p

Availability: Reference copy only

HS-021 822

COOPERATIVE MANAGEMENT SYSTEM MANUAL [TRAFFIC SAFETY]. JANUARY 1972 REVISION

The manual is a guide to procedures and forms used by the Memphis, Tenn., and Shelby County Traffic Safety Coordinating Com. (TSSC) and to the cooperative management system of that group. TSSC represents city and county agencies and citizen advisory groups responsible for traffic safety; its responsibilities include analytical work, development of recommendations regarding the specific traffic safety programs, and advising appropriate officials on matters concerning the total community safety program. Appended are a case example of form usage and a copy of the interagency agreement.

Memphis and Shelby County Traffic Safety Coordinating Com., Tenn.

1972; 114p

Availability: Reference copy only

HS-021 823

ARLINGTON ALCOHOL SAFETY ACTION PROGRAM EVALUATION OF 1974 OPERATIONS. FINAL REPORT

During 1974, the first operational year of the Arlington County, Va., Alcohol Safety Action Prog. (ASAP), more than twice the number of arrests of alcohol-impaired drivers were made than were made in 1973. The baseline period for evaluating ASAP statistically was 1971-1973. The five key effectiveness

indicators chosen were the following: 8 P.M. to 4 A.M. single-vehicle accident rate; alcohol-related injury accident rate; alcohol-related property damage accident rate; alcohol-related r:arrest rate reduction treatment group relative to comparison group; and pre-post life activity inventory interview score paired comparison. Time series projection techniques were used for analyzing the data of the first three indicators: all three increased in percentage terms. There is a need for a procedure by which the Medical Examiner would confidentially report all blood alcohol concentration (BAC) test data from driver and pedestrian fatalities to ASAP. Over 98% of the persons entering the ASAP program were determined to have or to be developing a drinking problem. Clients pay an entry fee. The education and treatment modalities to which clients are referred range from driver improvement school and alcohol education to group therapy, chemotherapy, and detoxification. ASAP graduates have their driving while intoxicated (DWI) charges reduced, while those who are convicted of DWI but decline to enter ASAP (and those who drop out of ASAP) receive substantially stronger penalties than did pre-ASAP DWI cases. Problems included delayed training of police patrol shifts and lack of BAC data on fatalities.

by David E. Camann
Arlington Alcohol Safety Action Prog., Arlington County, Va.;
Southwest Res. Inst.
1975; 114p
Subcontracted to Southwest Res. Inst.
Availability: Reference copy only

HS-021 824

ANNUAL EVALUATION OF THE INTER-TRIBAL COUNCIL OF NEVADA, INC. ALCOHOLISM PROGRAM, FEBRUARY 1969 TO JANUARY 1970

The Inter-Tribal Council Alcoholism Program (ITCAP), a federally funded project (Feb 1969-) begun on a nongovernmental basis in Aug 1967 to begin a statewide alcoholism recovery and rehabilitation program for Nevada Indians, has therapeutic value in spite of its limited resources of money and personnel. ITCAP has been active in educating the Indians by weekly gatherings and Alcoholics Anonymous meetings conducted in four locations. The first all-Indian workshop on alcoholism was held. Cooperation has been given by related agencies. A court program and a probation program have been started, as have programs of rehabilitation, employment, and follow-up. ITCAP attempts to change public opinion about alcoholics and alcoholism by identifying alcoholism as a disease and encouraging tolerance for its victims, and by relating use of alcohol to physical and emotional health.

by Allan G. Kilen
Inter-Tribal Council of Nevada
1970?; 72p
Availability: Reference copy only

HS-021 825

THE DRINKING DRIVER: PREVENTION AND DETERRENCE THROUGH THE MASS MEDIA

There has been little agreement in evaluation of mass media messages concerning the dangers of drinking and driving, due to interagency competition and differing points of view. Public information and education programs should convince the public that a major problem exists, that effective means exist

for reducing this problem, and that these methods deserve public support. Mass media spots can convey information but are not so successful in changing public opinion. Public service announcements often occupy "leftover" time slots and thus may not reach the intended audiences. Identification of such audiences and design of effective messages to reach them are also problems. Results of opinion surveys are now available; they should be studied, and agency representatives should meet periodically to share information on their respective activities. There should be monitoring, compilation, and circulation of materials in use. Such cooperative planning of public information campaigns must be based on a common understanding of the drinking driver problem, tenets of which are enumerated.

by James W. Swinehart
University of Michigan, Hwy. Safety Res. Inst.
1972; 18p
Prepared for Joint Conference on Alcohol Abuse and Alcoholism, Univ. of Maryland, College Park, 22-23 Feb 1972.
Availability: Reference copy only

HS-021 826

THE PUBLIC INEBRIATE AND THE HIGHWAY TRANSPORTATION SYSTEM

Of the one out of six highway deaths which are pedestrian deaths, 25% to 50% are alcohol-related. In addition, alcohol is involved in a significant number of nonfatal pedestrian accidents. Three approaches to dealing with the problem of the public inebriate or drunk are the following: physical separation of pedestrian and vehicular traffic; location of alcohol sources away from high-density vehicular traffic areas; and removal of the inebriated pedestrian from hazardous areas. A long-range need is identification and implementation or rehabilitation of the problem drinker and alcoholic. There should be an overall systems approach among the relevant agencies to risk management.

by Kent B. Joscelyn; Victor L. Streib
Indiana Univ., Inst. for Res. in Public Safety, Bloomington, Ind.
1972; 22p refs
Prepared for Joint Conference on Alcohol Abuse and Alcoholism, Univ. of Maryland, College Park, 22-23 Feb 1972.
Availability: Reference copy only

HS-021 827

EXPLORING SOME COMMON GROUND RELATIVE TO ALCOHOL ABUSE

The abusive use of alcohol is by far the largest single contributing factor in the occurrence of highway crashes, particularly fatal crashes. Review of statistical studies also shows that high blood alcohol concentrations (BAC's) at time of death are correlated with prior criminal convictions, and that driving alcoholics have higher crash rates than nonalcoholics. There needs to be a working resolution between the opposing philosophical approaches of the health care agencies and the law enforcement agencies. Traffic safety, public health, and law enforcement agencies would benefit from common record-keeping systems, as well as from joint use of techniques of identifying the problem drinker. A combination of a questionnaire and an interview has been developed which correctly identifies the problem drinkers 75% of the time when none of the controls has been misclassified. No fundamental shifts a

april 30, 1978

HS-021 830

seen in the roles of police agencies and of the courts; however, the following case flow is recommended: casefinding of the potential problem drinker; determination of the drinking problem; determination of the best way to deal with the problem drinker; and providing treatment. The general deterrent effect of existing law enforcement could be enhanced by greater visibility.

by Lyle D. Filkins; Rudolf G. Mortimer
University of Michigan, Hwy. Safety Res. Inst.
1972; 21p 12refs
Prepared for Joint Conference on Alcohol Abuse and
Alcoholism, Univ. of Maryland, College Park, 22-23 Feb 1972.
Availability: Reference copy only

HS-021 828

AN ANALYSIS OF THE USE OF MOTION PICTURE IN ALCOHOL EDUCATION

The National Hwy. Traffic Safety Administration, the Law Enforcement Assistance Administration, and the National Inst. on Alcohol Abuse and Alcoholism should jointly develop a mass media campaign based on recent research on the motion picture or film. A review of audiovisual education on alcohol shows that alcoholics are stereotyped, that young people are told that abstinence rather than responsible drinking is the norm, that there are few if any films directed to minorities, and that the only type of treatment portrayed is Alcoholics Anonymous. The concept of responsible drinking needs to be defined and demonstrated in behavioral terms. Information should be presented without bias. Fear-inducing messages are not effective in the mass media. For a film to be adequate for a given audience and purpose, goals must be clearly stated and the audience should participate in its preparation. Federal guidelines urging factual, honest presentations would help dispel vague and contradictory messages. Federal monies would best be spent for new films made by university cinematography departments and for training of group leaders to present such films. The goals of any mass media campaign are identification with and interiorization of the message. Appended are the criteria developed and used by an evaluation panel which reviewed 150 films on alcohol use and abuse, and annotations of those films considered to be excellent.

by Alex Sareyan; Pamela Wilson
(n.d.); 20p
Availability: Reference copy only

HS-021 829

THE EFFECTS OF DRUGS ON DRIVING RELATED BEHAVIOR AND THE IMPACT OF DRUGS ON HIGHWAY INCIDENTS. DRAFT REPORT

The relationship of drug use and abuse to driving and accidents is reviewed. Drugs of concern include both non-prescription and prescription drugs, hallucinogens, and narcotics. In particular, such psychotropes as sedatives, tranquilizers, and the major stimulants are of interest. There are as yet no effective means for assessing increased risk as a function of drug concentration levels. The types of drug users presenting the greatest risk on the highways include motorcy-

clists; alcohol consistently impairs performance; the combination of alcohol with other drugs generally produces an additive effect; no drug alters the blood alcohol concentration in the body; marihuana has not been found to impair performance; and more potent hallucinogens such as LSD have not been tested in this regard. Estimates of the incidence of drug use have been based on questionnaire surveys. About 20% of the driving population use or have used prescription drugs sometime in the past in conjunction with driving; a California survey showed that about 12% of the male adult population and 22% of the female adult population were frequent users of psychotropic prescription drugs. Drugs have been detected in approximately 5% of fatal crash victims and in about 15% of nonfatal crash victims. A greater proportion of drinking drivers uses drugs than is the case with the general driving population: at least 50% of drug users in both fatal crash involvements and in clinical studies have been found to be excessive users of alcohol as well. Personality and social abnormalities may be the primary contributing factor to drug use itself, including alcohol use.

by James L. Nichols
1970; 100p 91refs
Availability: Reference copy only

HS-021 830

STATEMENT OF THE NATIONAL CONFERENCE OF GOVERNORS' HIGHWAY SAFETY REPRESENTATIVES BEFORE THE SURFACE TRANSPORTATION SUBCOMMITTEE OF THE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION OF THE U.S. HOUSE OF REPRESENTATIVES

The accomplishments of the Section 402 State and Community Hwy. Safety Prog. and the relationship between Federal and state agencies are reviewed, and comments are made on sections 2-10 of HR-8944 concerning highway safety. Other issues addressed include the 55 mph speed limit, Section 403 research and demonstration, and the definitions and general provisions of 23 USC 402. The National Conference of Governors' Hwy. Safety Representatives (NCGHSR) makes the following points concerning HR-8944: objects to a state having to propose an alternative of high value for a standard element that has little or no value (section 2); refuses to support any sanction program (section 5); recommends Congressional review and updating of standards rather than repeal of the Gray Amendment (section 6); tentatively accepts incentive grants as an experiment, not to exceed \$10 million (section 7); requests administrative flexibility at the state level (section 9); and requests a single authorization regarding 402 funds, rather than the conflicting authorizations which the states currently receive from the National Hwy. Traffic Safety Administration and the Federal Hwy. Administration (section 10). Requests for funds allow for a 20% growth each year, of which almost half will be taken by inflation. Required state enforcement of the 55 mph speed limit is causing a sacrifice of enforcement on primary and secondary roads in favor of interstate roads. State involvement in Section 403 research and demonstration projects is again requested. The broad legal definitions of the terms

highway safety project and highway safety program can lead to unreasonable Federal power over the states.

by Carlton Fisher
National Conference of Governors' Hwy. Safety
Representatives
1975; 21p
Availability: Reference copy only

HS-021 831

EVALUATION OF AN EDUCATIONAL PROGRAM FOR JUVENILE ALCOHOL OFFENDERS AND THEIR PARENTS

The program for juvenile alcohol offenders and their parents established by the Second District Juvenile Court of Utah is evaluated by the following criteria: recidivism of participants in comparison with that of a control group; changes in attitude and in knowledge of alcohol of participants; relationship of attitudes and knowledge to recidivism; and relationship of knowledge and attitudes. Demographic and court-record data were studied of 29 alcohol offenders and their parents who participated in the five-session program and of 30 teenagers and their parents in a control group. The offenders were 16 and 17 years old, which excluded those who were not of legal driving age. Participants showed reduced recidivism, but no change in attitudes about alcohol or about the family. Knowledge about alcohol was increased in the participating teenagers and fathers. There was shown to be a negative relationship between recidivism and increase in knowledge about alcohol, a positive relationship between attitudes and knowledge in the control group mothers, and a negative relationship between these two variables in the treatment group fathers. Although more research on effectiveness of the program should be done, its apparent effectiveness in reducing recidivism suggests that expansion would be beneficial.

by David Bennion Adams
University of Utah, Dept. of Educational Psychology
1975; 77p 26refs
Availability: Reference copy only

HS-021 832

DEVELOPMENT OF CURRICULA FOR STATE AND LOCAL ALCOHOL SAFETY WORKSHOPS. TECHNICAL PROPOSAL

A plan is submitted for development and evaluation of curricula used in state and local alcohol safety workshops as part of Alcohol Safety Action Projects (ASAP's). Workshops include one-day, statewide meetings, interagency workshops, and local seminars. The attitudes of likely attendees are to be studied so that the appropriate methods of motivation can be chosen. The workshop strategy is based on a tutorial approach for the initial part of the meeting, followed by active participation of the attendees in planning solutions and projects. Workshop materials will include a guide, a detailed outline, and audiovisual materials. Each workshop will be pilot tested; revisions will be made, then the final workshop packages and a technical report will be submitted. The project is planned for a time period of twelve months. Corporate background and relevant experience

of the bidder are included, as are resumes of those proposed as staff members.

Dunlap and Associates, Inc., 1 Parkland Drive, Darien, Conn.
06820
Rept. No. Dunlap-9014; 1972; 31p
Proposal made to National Hwy. Traffic Safety
Administration.
Availability: Reference copy only

HS-021 833

STATISTICAL METHODS AND PROBLEMS ASSOCIATED WITH SPEED SAMPLING. FINAL REPORT

A speed measurement program must include field techniques for making the measurements, well defined criteria for selecting the sample of sites and times when studies are to be conducted, and mathematical procedures for combining and analyzing data from several studies and interpreting results. Techniques include radar devices operated by observers at the site, and automatic equipment with no requirements for observers to be present; although the latter is more objective and lower in cost, the former is the only currently available technique for widespread use. Thus certification programs must allow for current use of radar with future use of automatic equipment. It would be better to maintain, if not increase, the momentum of public acceptance of the 55 mph national maximum speed limit with whatever equipment is on hand, rather than to wait until increasingly rigorous data can be had. Speed observance data should be required as part of the states' certifications from the start, even though such data may be mathematically weak. States will have to divert equipment and manpower from high accident risk sites in order to monitor the 55 mph speed limit on major roads. Site selection and times of monitoring will have to be determined. Top priority should be given to sites located on Federal aid systems which had a higher than 55 mph limit and at which traffic volume during measurement is greater than some specified lower limit. Averaging processes now in use for analyzing and interpreting the speed data are generally understood but obscure such important information as numbers of motorists complying with the speed limit in relation to the numbers who are traveling at higher speeds. Percent of free-flowing vehicles exceeding specified speeds should be the primary measure for level of observance; counting measures such as the median and 85th percentile should be treated as corollary indicators. Top priority goals should be defined in terms of reductions in free-flowing travel in each speed range above 55 mph.

Institute for Safety Analysis, 6400 Goldsboro Rd.,
Washington, D.C. 20034
Contract DOT-OS-50155
1975; 85p
Availability: Dept. of Transportation, Office of the Secretary,
Washington, D.C.

HS-021 834

ALERT II - PROGRESS TOWARD A COMPUTERIZED CRIMINAL JUSTICE SYSTEM

The Alert I and Alert II computer systems used by criminal justice systems are described as they relate to law enforcement, prosecutors, municipal, magistrate, and circuit courts, corrections, and parole probation. Alert I is used by the Kan-

sas City, Mo., area law enforcement agencies. It contains 18 systems accessible by remote, mobile terminals in patrol units. It is helpful for making inquiries, dispatching, and making reports. The police patrol workload system is illustrated by a typical printout. The Computerized Police Planning System (COPPS) constructs a computer simulation model of the organization's functions; it is illustrated by a case in which space requirements for a headquarters is calculated. Alert II was established in Jan 1972. It contains a name index, general-purpose index, and a master data file. Its data are stored at Federal, state, and local levels. It is intended to be a comprehensive criminal justice data base, including data on law enforcement, prosecution, courts, corrections, and probation. Examples are given of the Kansas City Municipal Court system, the Jackson County, Mo., prosecuting attorney's system, and the Jackson County Juvenile Court system. Confidentiality of the data base is maintained by a series of steps such as program locks, data substantiation, and screening and authorization of users.

by Melvin F. Bockelman
Kansas City Missouri Police Dept., Computer Systems Div.
1972; 82p
Presented to the National Symposium on Criminal Justice
Systems, Oct. 1972.
Availability: Reference copy only

HS-021 835

ROAD CASUALTIES SINCE THE "DRINKING AND DRIVING" LEGISLATION

Numbers of road casualties occurring during the first six years of the drinking and driving legislation introduced [in Great Britain] in 1967 were studied to show trends over the years for different classes of road user, different ages of driver, and different times of day and day of week. The legislation is Part 1 of the 1967 Road Safety Act, which imposed a maximum permissible alcohol level of 80 mg per 100 ml of blood on drivers. The substantial reduction in casualties immediately following the introduction of the legislation (35% in the main drinking hours of 10 P.M. to 4 A.M.) has not been maintained. During the period 1967-1973, traffic had increased by 21%. Casualties for all classes of road user, drivers, passengers, pedal cyclists, and pedestrians, were reduced initially, but subsequent trends have been different. The proportions of casualties occurring in the main drinking hours, which indicate the effectiveness of the drinking and driving legislation largely independent of increase in traffic, have almost returned to prelegislation level in the case of drivers but has not increased to the same extent for other road users. The biggest increase over the years in casualties in the main drinking hours was for drivers under age 30, and particularly for those under age 20. The largest proportion of casualties in the main drinking hours (about 35%) occurred on Friday and Saturday nights.

by P. J. Codling
Transport and Rd. Res. Lab., Accident Investigation Div.,
Crowthorne, Berks., England
Rept. No. TRRL-Supp-14UC; 1975; 23p 6refs
Availability: Corporate author

HS-021 836

ALCOHOL AND ROAD ACCIDENTS. A DISCUSSION OF THE GRAND RAPIDS STUDY

In an Indiana Univ. study, drivers involved in accidents in Grand Rapids, Mich., from Jul 1962 to Jun 1963 were compared with a control group of drivers. Observations were analyzed with respect to nine variables, one of which was the blood alcohol level (BAL). Accident risk was found to vary significantly with each variable; in particular it was significantly higher for drivers with BAL's of 80 mg/100 ml and above than for those with alcohol levels lower than 10 mg/100 ml. Data concerning drivers with BAL's of 10-49 mg/100 ml suggest, generally at a low level of statistical significance, that accident risk rises steadily with alcohol consumption, but at the same time shows more certainly that more frequent drinkers have significantly lower accident risk than nondrinkers or infrequent drinkers. If the risk of accident involvement due to alcohol intake is ignored below 80 mg/100 ml, as a basis for estimating the minimum number of accidents due to alcohol, it is calculated on the basis of the Grand Rapids study that the number of drivers involved in accidents would have been reduced by 6%. Further analysis of the data is suggested.

(n.d.); 48p 7refs
Refers to "Role of Drinking Driver in Traffic Accidents," by
R. F. Borkenstein et al, 1964.
Availability: Reference copy only

HS-021 837

SENTENCING ALCOHOL-RELATED CASES: OPTIONS VIA JUDICIAL EDUCATION

There needs to be close cooperation between the courts and the alcoholism profession since there are at least 4.5 million arrests per year of persons having alcohol problems, about 2 million of whom pass through the courts without any response being made to their drinking habits. The nation's 20,000-40,000 judges see at least 10% of the nation's problem drinkers every year. Although judges have considerable power, they need to be supported by presentence investigations so as to be able correctly to refer defendants to treatment. Such an alcohol referral system should begin with commitments from the appropriate Federal funding agencies and from the relevant national associations of lawyers, judges, and the alcoholism profession. Introductory projects might include orientation teams, regional or state seminars, publications, a task force, and support for existing activities. Once established, the system could move into a statewide level of administration and responsibility. There would need to be a permanent system of continuing education since the turnover of judicial personnel is high. Funding for the alcohol referral system might come from such elements of the private sector as industry and labor organizations, insurance companies, or private foundations; such sources are listed. Possible sources of funding in the public sector include the National Inst. on Alcohol Abuse and Alcoholism, the National Inst. on Drug Abuse, the Office of Education, the Law Enforcement Assistance Administration, the National Hwy. Traffic Safety Administration, and the Dept. of Defense. The report reviews the structure of the

by Gary J. Scrimgeour
(n.d.); 79p 25refs
Prepared for National Center for Alcohol Education and
National Inst. on Alcohol Abuse and Alcoholism.
Availability: National Center for Alcohol Education

HS-021 844

SAFETY HELMET-HEAD INTERACTION STUDY USING HIGH-SPEED CINERADIOGRAPHY. FINAL REPORT

Six specimen industrial safety helmets were subjected to impact force by an 8 lb spherical mass, dropped from a vertical height of five feet to evaluate helmet-head dynamic performance by means of information obtained from 1000-frame-per-second X-ray cinematography, and impactor and dummy head acceleration instrumentation. The helmets were worn on the head of a seated Hwy. Safety Res. Inst. dummy. Peak and average forces, force durations, component and average resultant head accelerations are reported for each helmet type. Analysis and discussion include a defined helmet-head stiffness parameter, and consideration of the data on the basis of the Mean Strain Criterion Head Injury Model. It was found that high-speed X-ray cinematography gave good contrast and resolution image sequences during impact events and yielded analysis of helmet-head motion. All the helmets functioned properly with respect to head clearance, load distribution, and dissipation of impact kinetic energy. The higher the stiffness parameter for a given helmet, the better the head protection, provided tolerable g levels are not exceeded; however, no evaluation of potential neck injury could be made due to lack of knowledge about the head/neck interaction.

by Richard L. Stalnaker; Max Bender; John W. Melvin
University of Michigan, Hwy. Safety Res. Inst., Ann Arbor,
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Contract NIOSH-77-12122
Rept. No. UM-HSRI-77-48; 1977; 37p 6refs
Rept. for 29 Aug-31 Oct 1977.
Availability: Corporate author

HS-021 845

IMPROVING THE ROADWAY

Programs for improving the safety of the highway environment are reviewed in the light of accident reduction and in the category of spot improvement. A study of median turn lanes indicated that these reduce overall accidents by 15%-30%, with a comparatively low benefit/cost ratio. A study of speed-change lane design indicated that increased length of acceleration lanes reduces accidents significantly when merging traffic exceeds 6% of through traffic. The accident rate was found to vary with the percentage of merging and diverging traffic. Studies showed that roads with paved shoulders yielded lower accident rates, and an economic analysis, including maintenance costs, produced a cost/benefit priority rating for paving road shoulders. Accidents involving pedestrians were found to involve turning vehicles, with twice as many accidents attributed to left turns as to right. Backing vehicles were overrepresented in pedestrian accident rates. Improvements in accident rates to pedestrians resulted from such devices as median barriers, midblock cross walks, diagonal parking, meter post barriers,

dedicated turn lanes, and other measures. The study also discussed pedestrian safety, perhaps because of a false sense of security. Studies on freeway lighting showed that lighted freeways have fewer accidents than unlighted ones and that nighttime accidents occur as frequently between interchanges as within them. A study on railroad grade crossings showed that accidents at these intersections result in a high driver fatality and injury rate. Protection at railroad crossings was found to be inadequate, many having only passive warning systems. Studies of painted line delineations did not indicate a significant decrease in accident rates, but use of raised markers was found to decrease total accidents by over 30%. Skid-proofing by overlay or by pavement grooving was found to reduce accidents by 73% or more, although the control data for these studies were not comprehensive. Two studies by the Michigan Dept. of State Highways indicated that accidents were significantly reduced by the addition of lighted overhead lane use signs. Here too there were inadequate control data. Median design is thought to be a factor in freeway accidents. Cross median crashes are relatively rare but much more severe than any other highway accidents. Decreased median width was found to increase the probability of a crash. One study found that a 30 foot obstacle-free median appears to be the minimum for safe design, with flatter slopes on the median showing lower accident severity rates. A study of structural concepts for bridge design and for roadside obstructions indicated that a 30 foot clearance from the edge of the pavement to any obstacle would be desirable, although right-of-way costs and bridge span lengths present problems affecting the cost-effectiveness of these concepts.

by William W. Hunter; J. Steven Desper
University of North Carolina, Hwy. Safety Res. Center,
Chapel Hill, N.C.

1976?; 19p 36refs
Extracted from a Hwy. Safety Res. Center report,
"Implementation of Proven Technology in Making the
Highway Environment Safe," prepared under a grant from the
Motor Vehicle Manufacturers Assoc.
Availability: Reference copy only

HS-021 846

CUSHIONING THE CRASH: ROADWAY IMPROVEMENTS

Research efforts on roadway improvements which cushion vehicle crashes have stressed the resultant crash forces to the vehicle rather than the extent of occupant injury as criteria for effectiveness. Studies on bridge rail design indicate that these objects are struck in 22% of all fatal single vehicle crashes against a fixed object. Experiments with energy-absorbing guard rails all indicate a lower vehicle damage rate than is produced by a flat-faced concrete rail. No accident-based evaluation data were used. Various types of median barriers have been tested. Under critical crash conditions, the metal beam guard fence provided lower acceleration force and should be used on wider medians. Concrete barrier (CMB) should be used on narrow medians and functions adequately in crash tests with large trucks. A system was successfully tested of two parallel guard rails designed to prevent the striking vehicle from rebounding into the traffic lane; this system resulted in very low g's to the vehicle. Accident-based studies on median barriers tend to produce misleading results: an increase in total accidents and a dramatic decrease in fatal accidents. Crash tests of improvements to guard rail and median barrier terminals indicate that redesign can reduce the severity

of accidents. Impact attenuation devices are designed to reduce accident severity rather than frequency. Those devices tested were mainly water-filled or sand-filled cells, or steel drums. One study indicated that these devices eliminated fatal accidents, reduced injury accidents by 61%, and increased property damage accidents by over 260%. Roadway lighting (luminaire) supports have been designed as breakaway structures to reduce roadside hazard. The aluminum pole with a cast shoe base was considered a superior design and the steel slip base with aluminum or steel pole was the least costly. Location of light poles in a median over 30 feet wide was considered less hazardous than an outer side location. A more recent study showed that the accident cost of breakaway poles is a fifth of the cost of conventional poles and resulted in a 75% reduction in injury accidents. Work has been done in developing breakaway sign supports rather than the conventional yielding design. Overhead signs present a more difficult problem. One type has been tested with four breakaway columns so placed that if one column were struck, the sign would be supported by the remaining ones. Removal of utility poles from the roadway would be extremely costly although it would result in a 38% reduction in fatal accidents (15% increase in injury accidents). Utility poles could be made breakaway by drilling holes in them. Removal of trees along the roadway is also effective in reducing accident fatalities and injuries.

by Forrest M. Council
University of North Carolina, Hwy. Safety Res. Center,
Chapel Hill, N.C.
1975?; 17p 15refs

Extracted from an HSRC report, "Implementation of Proven Technology in Making the Highway Environment Safe."
Prepared under a grant from the Motor Vehicle Manufacturers Assoc.

Availability: Reference copy only

HS-021 847

IMPROVING THE VEHICLE

The history and development of motor vehicle inspection (MVI) programs is reviewed and the related research on the following topics is examined: the role of vehicle mechanical defects in accident causation, the ability of various inspection programs to detect and correct mechanical defects, and the effectiveness of motor vehicle inspection in reducing highway crashes. A table of international MVI practice is included. Finland is credited with having the first MVI program in 1922. A voluntary MVI program began in the U.S. in 1927, with no Federal guidelines being supplied until 1966, when Congress passed the Hwy. Safety Act. Minimum requirements for state MVI programs stipulated annual inspection by specially trained personnel on all safety-related components and maintenance of specified records, summaries of which were to be published annually. The present great diversity among state inspection programs is thought to be due to lack of supporting research for Federal guidelines and to the "cost-benefit" dilemma confronting the states. Mechanical defects play a definite yet perhaps minor role in accident causation. Brake system defects were considered most important in accident causation, followed in order by tires and wheels, communication (lights) and steering systems, body and doors, power train and exhaust, suspension system, and driver seating and controls. The mechanical condition of a vehicle deteriorates with time and mileage, and inspection improves the mechanical condition of those components tested. Studies comparing mor-

indicate an association favoring MVI laws, not a causality. A classification of all accident rates against time since inspection indicates that inspection has little effect. Periodic MVI is more effective than random inspection and semiannual inspection is significantly more effective than annual. Further research is needed to determine the effectiveness of MVI and to define the most effective MVI program approach. Present and future trends indicate that the states will continue to upgrade their programs to conform to the 1973 vehicle-in-use standards which recommend minimum inspection criteria for tires, brakes, steering and suspension, with possible brake lining inspection. Previous research has indicated a need to intensify inspection with vehicle age and mileage. There have been various diagnostic inspection programs which may lead to the greater use of mobile inspection facilities. Wisconsin has proposed a program of personal vehicle inspection, the owners certifying that their vehicles comply with state inspection laws.

by Donald W. Reinfurt; Jane C. Stutts
University of North Carolina, Hwy. Safety Res. Center,
Chapel Hill, N.C.
1975?; 18p 12refs
Availability: Reference copy only

HS-021 848

THE AUTOMOBILE. IT'S THE SUPER-DRIVER OF BOTH TECHNOLOGY AND SOCIETY

The cost of an automobile in terms of weeks of the purchaser's salary has halved between 1950 and 1975. The automobile accident fatality rate per 100 million vehicle miles has dropped from 18 to 3.8 since 1925, due to safety improvements in automobiles. Further improvements must be made through reducing accidents involving alcohol and young drivers. Mandatory use of seat belts could reduce highway fatalities by 25%, and the U.S. 55 mph speed limit saves lives and provides fuel economy. What is needed is a concept of accident prevention rather than crash survival. The need for fuel economy, clean air, safety, and quiet has accelerated the search for alternate engines. In addition to gasoline, electric and diesel engines, there are the gas turbine and the Stirling engine, which are more efficient in controlling emissions. These will be judged on economics, performance, and reliability. Future automobiles will be smaller and lighter, containing more high-strength low-alloy steel, aluminum, and plastics. The zinc nickel oxide battery or the lithium sulfur iron cell may increase the market for electric cars. Alternate fuels are also being explored, such as electricity from coal or nuclear power for recharging electric vehicle batteries, or liquid fuel (methanol) from coal. The application of electronics to automobile technology can provide more precise engine and braking control, and can also aid in vehicle manufacturing. Digital systems control can be applied to a vehicle's electric system. Among the future issues concerning motor vehicle manufacturers are the role of automobiles in a balanced transportation system and new systems for controlling traffic. The impact of vehicle changes upon the consumer is an issue of critical importance.

by Trevor Jones
Publ: IEEE Spectrum v14 n11 p26-9 (Nov 1977)
1977
Availability: See publication

The applications of electronics in automobiles are increasing due to increased density, lower cost, and improved reliability of solid state technology, to manufacturer cooperation, to the increasingly stringent standards for fuel economy and exhaust emissions, and to the industry's wish to provide customers with cost-effective benefits. Present automobiles contain up to 21 electronic systems (list provided). The major uses for electronics for now and the near future involve engine control for improving fuel economy and for reducing exhaust emissions. Closed-loop engine control, spark-timing control and knock-limiting systems (selective ignition timing) are three current electronic applications. Electronic data centers with digital readout, such as the Cadillac Tripmaster, are new developments. More advanced developments include automatic braking systems and drunk driver detectors, both of which have problems to be solved before they can be marketed.

by Trevor O. Jones
Publ: IEEE Spectrum v14 n11 p34-5 (Nov 1977)
1977; 4refs
Availability: See publication

HS-021 850

THE AUTOMOBILE: FOR BETTER OR WORSE

There are many factors involved in the increase in electronic applications in automobiles, among them the fact that electronics can be the only cost-effective answer to a problem. For example, the closed-loop engine system depends on electronic controls. Key questions are answered on the state of electrical/electronics technology in automobiles. The use of microprocessors is presently limited by high cost. The problems of the effect of engine temperature on semiconductors can be handled by locating the devices in the passenger or engine compartment instead of in the engine itself. Electronics development is not thought to be able to reduce car prices in the near future. Electromagnetic interference, which may be caused by vehicle systems or which may affect vehicle operation, brings about the necessity for overdesigning electronic equipment for safety. Electronic systems for controlling pollution show promise. Research continues on radar guidance and collision warning systems, among them the experimental RCA system using a standard FM CW radar operating at X band. Little has been done as yet on solar-powered car research. One study comparing energy consumption and performance indicated that fuel costs and maintenance costs for electric vehicles (31 British vans) over five years were each approximately \$100 less per year than for gasoline vehicles. Limited on-board diagnostic systems are of interest to the automobile industry, although the sensors and logic for such systems is costly. A system introduced by Volkswagen did not succeed. A hand-held analyzer has been manufactured for 1977 General Motors cars, which tests faults in battery, ignition switch, neutral start switch, starter, high-energy ignition, regulator, and alternator.

by Ronald K. Jurgen
Publ: IEEE Spectrum v14 n11 p31-3 (Nov 1977)
1977
Availability: See publication

Five categories of needs affect the evolution of a wide range of automotive electronic applications, a number of which feature the microprocessor as a central element. These categories include government emissions and economy standards, vehicle maintenance, general utility, safety and security, and driver comfort, convenience and pleasure. Functionally, a microcomputer must have temporary memory storage, inputs and outputs, a built-in capability to perform a set of instructions, and the ability to accept or hold a man-made program. A typical electronic system for engine control can manipulate the controls in a wide variety of patterns, resulting in high performance with wide-open throttle and in avoiding the necessity for cumbersome mechanical devices. Among the challenges that remain before the microcomputer's role in automotive applications can be increased, are reduced microprocessor costs and increased availability of efficient, low-cost sensors, transducers and actuators, which provide the interface between microcomputers and such automobile variables as speed, temperature, and pressure. Semiconductor technology is expected to deal with the latter challenge. A third challenge involves application of electronics to the engine itself. At present there is a question of choice between general-purpose and specialized, or dedicated, microcomputers. General-purpose microcomputers will dominate the market initially and be gradually displaced by dedicated microcomputers. A general-purpose microcomputer is compared with a dedicated optimized one. Suppliers of these devices recommend the progression from general to specific applications as automobile manufacturers become acquainted with microcomputer capability. As electronic systems progress from one central processor requiring much wiring to distributed processing by satellite microcomputers, less wiring would be required, system reliability would be increased, and a vehicle could operate even if the central processor should malfunction. Distributed processing will increase the role of such devices as optocouples and fiber optics as links between central and satellite processors. Future versatility aspects and custom performance could be achieved if each application were designed with unique medium-scale-integration (MSI) interface IC chips, which would be under the complete control of the customer and could be changed to keep up with changing sensors and actuators at a cost of less than \$5 in volume quantities. The requirements for engine-control electronics change rapidly. For cost effectiveness, every system wire, sensor, actuator, and electrical component must perform its own function, must be trustworthy, and must have the utmost physical simplicity. Tasks to be performed by a full engine management electronic controller include spark timing, fuel control, carburetor manipulation, and recycling of some exhaust gases through the carburetor. The instruction program within the microcomputer chip is contained in an electrically alterable memory array, which can be supplied with test exercises and which can be loaded and verified in assembly or by the automobile dealer via telephone data from a regional computer center. Prognostic measurements are also possible of tire pressure, oil pressure, temperature and brake fluid pressure changes, and wear on tie rods and ball joints.

by Gene Puckett; John Marley; John Gragg
Publ: IEEE Spectrum v14 n11 p37-45 (Nov 1977)
1977
Availability: See publication

BALANCING CLEAN AIR AGAINST GOOD MILEAGE

Political debates to the contrary, there is direct interaction between emissions and fuel economy. The variations of hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) emissions against air-fuel ratio are shown. Emissions are also affected by adequate oxygen, by combustion time, and by temperature. Emission controls for CO and HC are often compatible with fuel economy, but these measures tend to increase NOx emissions. High combustion temperatures aid in formation of nitric acid, which results in formation of ozone and other oxidants. If combustion temperature is lowered while attempting to maintain engine efficiency, HC emissions increase and fuel economy is lowered. Lowered combustion temperature under conditions of lowered engine efficiency results in a lower fuel economy. Use of a three-way catalyst also decreases fuel economy. Oxidation catalysts, usually containing platinum, can be used for further burning of CO and HC in the exhaust gas at spark and idle speed settings compatible with fuel economy. The electronic lean-burn system, which gives fuel economy in highway driving, features a spark control computer and sensors to measure engine speed, intake manifold vacuum, throttle position and rate of throttle change, inlet air, and coolant temperature. Higher engine rpm and retarded spark timing result in increased fuel consumption, only partially offset by use of leaner air-fuel mixtures. Precontrolled engines produce about 30% better fuel economy. An air pump, sometimes with a form of air switching, is used to achieve improved emissions control, resulting in a fuel economy penalty of from 3% to 7%. Use of an air aspirator valve as an alternative to an air pump does not affect fuel economy. Exhaust gas recirculation reduces peak combustion temperature, reducing NOx formation, and lowering fuel economy by reducing engine cycle efficiency. In some engines, fuel economy has not been lowered, due perhaps to an improvement in fuel distribution among the engine cylinders. As illustrated by the measures described above, a compromise in fuel economy is necessary if emission controls are required.

by Charles M. Heinen; Eldred W. Beckman
Publ: IEEE Spectrum v14 n11 p47-50 (Nov 1977)
1977
Availability: See publication

HS-021 853

CLOSED-LOOP ENGINE CONTROL

One of the most promising schemes under investigation for meeting the 1981 emissions standards for hydrocarbon (HC), carbon monoxide (CO), and nitrogen oxides (NOx) is a three-way catalyst in conjunction with a closed-loop engine control system. For proper operation of the three-way catalyst, the air-fuel mixture in an engine must be precisely controlled. A lean mixture gives good control of HC and CO and poor NOx control; a rich (low oxygen) mixture gives good NOx control and poor control of HC and CO. The closed-loop engine-control system, called the Phase II Catalyst System, is designed to maintain the precise air/fuel mixture. Components of the system include an exhaust gas sensor (zirconium element coated with platinum), an electronic control unit which converts the sensor information to a vacuum modulator, and a carburetor which is signalled by the modulator to control the air/fuel mixture for proper operation of the catalytic converter.

air/fuel ratio. The engine receives the air/fuel mixture from the carburetor through the intake manifold, burns the mixture, and passes it down the exhaust manifold past the exhaust sensor and through the catalytic converter. A characteristic of this system is the time delay involved before the sensor can observe changes in air/fuel mixture, engine and intake distribution problems, and flow variations through the engine. The electronic control unit is designed to compensate for the sensor time delay by correcting over time (integral control) and by correcting quickly (proportional control). On engine start, there is a period when the sensor is too cold to provide air/fuel ratio information. Use of a resistor can correct this problem by causing the sensor output to be pulled to a low-voltage state, interpreted as a lean mixture signal by the control logic. As the sensor gets hot the resistor's effect is overcome. During the cold start operation, an open-loop operation is used, which may need to be replaced by a specific, intermediate air/fuel ratio (duty cycle) if tighter emission standards are implemented. Other features can be added to the control logic to improve drivability or emissions performance. An analog control unit may be least costly, but a microprocessor will offer the flexibility to incorporate additional engine-control functions as these become necessary or desirable.

by George W. Niepoth; Stephen P. Stonestreet
Publ: IEEE Spectrum v14 n11 p53-5 (Nov 1977)
1977
Availability: See publication

HS-021 855

CARS AND KILOWATTS

Examples of limited production of electric vehicles and hybrids are the Sebring-Vanguard CitiCar and the Italian Zagato Elcar; these were designed as electrics rather than as conversions of conventional cars. Electric vehicles vary greatly in performance and range. There is interest in the use of electrics as delivery vehicles, the Postal Service having ordered 352 electric quarter-tonne trucks. Some cities are using electric buses on short runs. The hybrid vehicle seems to be thought of as a reduced emissions measure rather than one for increased fuel economy. The cost of twin power plants and the shifting potential for economy reduce the margin for improvement offered by the hybrid, a combination of battery and engine/generator. One hybrid is the Volkswagen Taxi; another is a bus application by Daimler-Benz. In the "augmented electric" approach, a small on-board engine/generator is added to charge the batteries continuously. It serves as a range extender and an emergency power source. Significant electric and hybrid vehicle development is underway in France, Italy, Sweden, and Russia, with the largest European effort by West Germany and England. The German Gesellschaft für Elektrischen Strassenverkehr GmbH (GES) and its research partners strongly emphasize a systems approach divided among vehicles, batteries, and support systems. The GES believes, as does England, that urban transportation is a logical first step for these vehicles. England has been engaging in battery research, including a demonstration of the world's first sodium-sulfur, high-temperature battery in a vehicle (1973). As a unique experiment in a total systems approach to public transit, 35 small electric vehicles have been for rent since Mar 1974 in the urban center of Amsterdam. The system features a magnetically coded card which serves as a key to the vehicle, with charges billed through a monthly charge account. A major national effort to advance electric vehicle technology has been

underway in Japan since 1970, involving the evaluation of new construction and propulsion technologies. Experimental vehicles have been developed in the categories of lightweight and small passenger cars, lightweight and small trucks, and buses. Featured were improved lead acid batteries, seven different battery systems, three new motors and controllers, plastic body materials, and support systems. A two-part battery (zinc-air for long range and lead-acid for acceleration) demonstrated a 455-km range at 40.2 km/h. The lead-acid battery is the only one in production for vehicle use. U.S. efforts in electric vehicle development are expected to increase due to Public Law 94-413, under which the Government will purchase or lease 2500 vehicles in 1978 and 5000 more in 1981. Service support for electrics and availability of spare parts will affect the success of these vehicles as a transportation alternative.

by Harvey J. Schwartz

Publ: IEEE Spectrum v14 n11 p65-8 (Nov 1977)

Availability: See publication

HS-021 856

WHAT COMES NEXT IN AUTO SAFETY

The new fuel economy standards for model year 1981 through 1984 passenger automobiles, and the required use of passive restraint systems by 1984, should result in production of a car in the mid-1980's much safer to ride in and more economical to operate. Changes needed in the next decade may involve continuing Federal regulations by the National Hwy. Traffic Safety Administration (NHTSA): development of alternative power plants and use of new materials to improve crashworthiness. The problems of automobile/pedestrian accidents, automobile/motorcycle accidents, and bicycle accidents are increasing; Congress, in removing NHTSA's penalty power, has encouraged state legislatures either to repeal or weaken existing laws for safety helmet use. The truck and bus air brake regulation, Federal Motor Vehicle Safety Standard (FMVSS) 121, Air Brake Systems, should prevent many automobile/truck collisions. Use of the passive restraint system and improvements in vehicle construction and fuel system integrity should lower the death and injury rate. However, the growth in the market for vans, light trucks and multipurpose passenger vehicles, for which safety standards have been allowed to lag behind passenger car standards, may lead to a rise in deaths and injuries in crashes involving these vehicles. Accidents involving side impacts produce a large number of injuries and fatalities; safety research has demonstrated that there are relatively simple countermeasures to improve side protection through minor modifications. The automobile industry, by taking advantage of technological possibilities to improve fuel economy and safety, can reestablish itself as a growth industry, working in the near future to improve safety, emissions and energy use, and later to promote major changes in propulsion systems to alternative heat engines and in fabrication to lightweight, high-strength structures.

by Joan Claybrook

Publ: Traffic Safety v77 n11 p8-9, 34-5 (Nov 1977)

Availability: See publication

HS-021 857

DRIVER EDUCATION: WHERE DOES IT BELONG?

Expectations placed on the driver education program in the school curriculum may exceed anything that could realistically be accomplished; the two goals are that it provide basic instruction in driving techniques, knowledge of how to handle a car in special circumstances, environments and emergencies, and knowledge of local and state motor vehicle traffic laws, and secondly that it produce a far more knowledgeable citizen knowing enough about highway safety to demand and support higher safety standards. Though the second goal requires far more time and information than can realistically be provided by such a course, the school could present additional information relevant to safe driving, incorporated in various courses such as physics, government, biology, sociology, and psychology. Since driving holds high motivational value for most high school students, the teacher might express a concept in terms of the driving task to make it more palatable. For instruction in actual driving and traffic law, a program should be developed in which schools collaborate with the home. A gradual introduction to driving is recommended, with a limited license at first, restricting driving to low-risk daylight hours in company of a responsible adult; after six months the hours might be extended, with further changes as the driver gains experience. A short refresher course might be given after this period of practical road experience. As he graduated from one level to the next, the young driver's license would be endorsed accordingly. Before implementation of this or any other program on a large scale, a careful evaluation should be made of a pilot program to provide a basis for wise investment of limited funds.

by Patricia F. Waller

Publ: Journal of Traffic Safety Education v15 n1 p7-9 (Oct 1977)

1977; 6 refs

Based on a presentation to the National Conference of Governors' Hwy. Safety Representatives, Portland, Oreg., Oct 1976.

Availability: See publication

HS-021 858

HELPING YOUNG CHILDREN LEARN TO COPE WITH TRAFFIC

A course in traffic accident prevention for very young children is described. The problems of children in coping with traffic are enumerated: the eye level ranging from 36 to 40 inches above the ground, so they cannot see over the hoods or trunks of cars, fences or mounds of snow; the uncertainty in focusing and perception; the inability to deal with multiple incoming stimuli; short attention spans and intense spontaneous reactions resulting in action without prior thought. Teaching good habits while a child is two, three, and four should be the responsibility of parents and teachers working together. The program, "Preschool Children in Traffic," is based on five booklets: a guide for parents and four booklets for them to use with their children, discussing the illustrations and practicing the ideas in real traffic environments. Basic concepts are stressed in the first book: learning to differentiate between places for cars and for walkers, learning to stop prior to entering streets. A section on driveways includes identification of vehicles operating in reverse gear. The second booklet is

tersections, which a child in kindergarten or first grade may encounter. Practice in crossing is suggested, with reminders that all drivers are not reliable and sometimes do not respect crosswalks, so caution is necessary. The fourth booklet is designed to help children learn to use traffic signal lights; a great deal of adult guidance is recommended, with practice in order to become proficient. Of those who participated in the program, nearly all the parents felt it was extremely beneficial to their children, and the teachers' responses were overwhelmingly positive; they felt the program was needed, well prepared, and a useful tool for improving home/school communications.

by Sylvia P. Ross

Publ: Journal of Traffic Safety Education v25 n1 p11-3 (Oct 1977)

Excerpts from a presentation at the Midwest Assoc. for the Education of Young Children, Wichita, Kans., 24 Mar 1977. Availability: See publication

HS-021 859

SHIPMENTS OF NUCLEAR FUEL AND WASTE...ARE THEY REALLY SAFE?

A summarized status report is presented on the potential hazards of nuclear materials shipments in routine commerce and on conventional transportation equipment. Such shipments are subject to normal accident environments; a highly developed system of packaging and protection has therefore evolved, based upon the degree of radioactivity of the material, so that accidents will not release any serious amounts of nuclear materials. The same basic safety standards are in worldwide use. The packages must also provide adequate radiation shielding to protect transportation workers and the general public. For spent fuel and high-level nuclear wastes, the packages must have heat dissipation characteristics to protect against overheating from the self-heating character of these materials. For both fresh and spent fuel, package design must also provide nuclear criticality safety under both normal transportation and severe accident conditions. The Nuclear Regulatory Commission reviews package designs before issuing a certificate of approval. Types of radioactive wastes are described: high and low-level, and other, with the different types of packaging required. Cross-sections of the shipping containers are shown. The accident damage test sequence specified in regulations includes a high-speed impact test, followed by a puncture test, a fire test, and a water immersion test, producing damage conditions comparable to the actual damage a package might encounter in a hypothetical severe transportation accident. Reactor locations as of 31 Dec 1976 are shown, and the disposition of high-level and low-level waste is discussed. The magnitude of the radiation risk from accidents involving nuclear shipments, and the overall environmental effects from transporting nuclear fuel and solid wastes are evaluated. Risk to truck drivers, freight handlers, and the general public under normal conditions is assessed as a very small fraction of the annual permissible man-made exposure. The number of potential accidents involving nuclear shipments is calculated at about 13 per year, all from conventional causes, with release of nuclear materials only in the worst conceivable accident. The probability of death, injury, or massive property loss due to transportation of radioactive materials is: determinable, not zero, and very small. The risk of public catastrophe has been eliminated by strict standards, engineering design safety and operational care; in any accident

small compared to the nonnuclear effects. The long-term public burden of not transporting nuclear material is likely to be higher than the risks of carefully controlled transportation; the likelihood of death, injury, or serious property damage from these nuclear aspects is thousands of times less than such likelihood from more common hazards now accepted by the public as necessary risks.

Department of Energy, Transportation Branch, Washington, D.C. 20545

Rept. No. DOE/EV-0004; 1977; 13p 19refs

Availability: Corporate author

HS-021 860

THE ALCOHOL CONNECTION

Solving the problem of the drunk driver would save three times the 9000 lives per year estimated to be saved by the installation of passive restraints. Half of all highway deaths involve the use of alcohol, which is the country's number one social problem. Driver impairment is brought about by as few as two drinks, yet in Washington, D.C., a city with the highest per capita use of alcohol, DUI (driving under the influence) arrests average one per day and convictions rarely change the attitude of the violator. One program in southern California seems to have some effect in lessening the DUI problem: a school called 3D (Don't Drink and Drive) for first offenders, which costs \$300. After processing 5000 students, the program has resulted in a 30% reduction in moving violations and accidents among graduates, and repeat alcohol-related violations are 120% lower than among other violators. The school features a series of informal lectures on the effects of alcohol and a performance-type driving school. Blood Alcohol Level (BAL) is emphasized, as is its effect on the vision and coordination centers of the brain. The Rule derived from the program specifies that for safe driving, drinking should not exceed one 1.5 ounce drink per hour and that one should not drive until an hour after the last drink. Time spent in the school's Bondurant-type defensive driving course demonstrates that even sober persons are not usually good drivers.

by Jon Thompson

Publ: Road Test v14 n1 p24-7 (Jan 1978)

1978

Availability: See publication

HS-021 861

AUTOMOBILE INSURANCE LOSSES INJURY COVERAGES. CLAIM FREQUENCY RESULTS FOR 1974, 1975, AND 1976 MODELS

Variations in the rate of injuries among different types of cars are studied by examining automobile insurance data. Claim frequencies are based on counts of crashes involving at least one medical claim under first-party coverages. Tabulated data are presented separately for medical payments or Medpay coverages and for no-fault personal injury protection or PIP coverages. The report is based on the experience of 1974 model year private passenger vehicles in the calendar period Sep 1973-Dec 1976, of 1975 model year vehicles in Sep 1974-Dec 1976, and of 1976 model year vehicles in Sep 1975-Dec 1976. Claim frequency results are presented for vehicle size classes and for the following subgroups under each size class: regular two-door models, regular four-door models, station wagons, and sports or specialty models. The frequency of in-

jury claims under both medical payments and personal injury protection coverages for all model years and ages of cars studied is strongly related to vehicle size: smaller vehicles have the highest and larger vehicles the lowest injury claim frequencies. Within each car size group, two-door models consistently have higher injury claim frequencies than do four-door models. Within each car size group, sports and specialty cars generally have the highest injury claim frequencies. There are substantial variations in the injury claim frequencies of different cars of the same size and body style. Variations in the injury claim frequencies of the cars in each model year are much more pronounced than the differences between those in different model years.

Highway Loss Data Inst., Watergate 600, Washington, D.C. 20037

Rept. No. HLDI-I-76-1; 1977; 75p

Availability: Corporate author

HS-021 862

TRUCK AND BUS SIZES AND WEIGHTS. 1977 EDITION

Tabulated and graphed data on state laws concerning truck and bus sizes and weights are presented, with summaries of legislation passed, failed, and pending for each type of limit, by state. The following length limits are considered: buses; straight truck; semi and full trailers; tractor semitrailer; truck and full trailer; tractor and semitrailer and full double trailer; truck and two full trailers; tractor and semitrailer and two full (triple) trailers, and minimum tandem axle spacing. Maximum vehicle heights and widths are given. The following weight limits are considered: vehicle and combination gross weight basis; per inch tire width; per single axle; per tandem axle 48-inch spacing; two, three, and four axle single units; two-axle tractor with one-axle and two-axle trailer; three-axle tractor with two-axle trailer; three-axle truck with two-axle trailer; tractor, semitrailer, and full trailer five axles; and maximum gross vehicle weights. The maximum weight and width limits of the interstate system are presented, as are comments and exceptions of the various limits, by state.

Motor Vehicle Manufacturers Assoc. of the United States, Inc., 300 New Center Bldg., Detroit, Mich. 48202

1977; 32p

Availability: Corporate author

HS-021 863

NEW MATERIALS, IMPROVED DESIGNS MEAN BETTER AND LIGHTER BRAKES

The latest automotive and industrial brakes are safer, lighter and less expensive because of improved linings, more efficient actuation methods, and unconventional materials replacing iron. Such materials include aluminum, steel stampings, and plastic; they are used for such parts as housings, pistons, master cylinders, and rotors. Illustrations include the following: Chrysler's phenolic brake piston; the two-piece master brake cylinder with aluminum body in 1978 Volares, Aspens, LeBarons, and Diplomats; aluminum housing of Bendix Series IV brake; Kelsey Hayes master cylinder for mounting on snowmobiles (plastic piston and body); B.F. Goodrich air disc brake for trucks; Wabco rail-car brake; Lucas Industries drum brake for trucks and buses; U.S. Steel's master cylinder; and a Dupont brake with Vespel aramid lining. Pneumatic and

hydropneumatic actuation are being used for brakes. Alternative fibers being tried to replace asbestos include the Bendix semimetallic lining composed of iron powder and graphite reinforced with steel fibers and bound with a phenolic resin, and the Dupont Vespel aramid shoe.

by David T. Curry

Publ: Machine Design v49 n25 p140-4 (19 Nov 1977)

1977

Availability: See publication

HS-021 864

BRAKE SYSTEMS--PART 1

Procedures to follow in performing a complete drum or disc brake job are described and illustrated. The material is divided into the following sections: pedal power, the hydraulic system, drum brakes, disc brakes, and parking brakes. A troubleshooting guide is appended which pinpoints problem areas for a complete brake service job, and lists the varied causes of such problems and the steps to be taken to correct them. Also appended is a checklist used by one brake service for a complete brake job.

National Tire Dealers and Retreaders Assoc. Tire Service Specialist Com.

Publ: Dealer News v40 n32 (14-21 Nov 1977)

1977; 12p

Availability: See publication; National Tire Dealers and Retreaders Assoc., 1343 L St., N.W., Washington, D.C. 20005

HS-021 865

EVALUATION OF ALTERNATIVE TRAFFIC OPERATIONS PLANS FOR THE COMMUTER LANES ON THE SHIRLEY HIGHWAY IN VIRGINIA. FINAL REPORT

The Henry G. Shirley Memorial Hwy. (I-395) in northern Virginia was built with two exclusive, reversible lanes for preferential treatment of high-occupancy vehicles within a multilane freeway serving the Washington, D.C. commuter traffic. Twelve alternative operation plans were tested and evaluated; they involved such variables as three-person carpools, four-person carpools, and various access and egress limitations at one, two, three, or none of the applicable ramps. Factors considered in the evaluation were the following: growth of carpool use; travel time improvement; characteristics of the surveyed commuters; impact of carpool use on bus ridership; operational characteristics; and fuel consumption and vehicle emissions. Provision of an exclusive roadway for use by such high-occupancy vehicles as buses, vanpools, and four or more person carpools has proven to be a successful incentive for formation of same. Since Dec 1973 when the express lanes were opened to use by carpools and vanpools, their number has increased from 250 to more than 3000. The forecasting technique developed to estimate carpools was reliable and would be applicable for use on similar studies. There were demonstrated time savings of up to 15 minutes by users of the Shirley Hwy. express lanes. The express lanes attracted carpools from metropolitan area zones normally not included as a part of the highway corridor; a significant number travelled out of their way to use them. Bus routes were re-routed so as to take advantage of the express lanes; bus ridership on such routes increased. A survey of carpool commuters showed that they would be willing to form or join a carpool

only because this facility existed. There was much pressure on the Virginia Dept. of Transportation to reduce the number of required persons in a carpool to three, but it was determined that such a change would significantly lower the level of service on the express lanes during peak travel periods. Availability of the express lanes has encouraged private bus companies to offer more commuter service. A carpool locator service provided information on forming and maintaining carpools.

by J. C. Allen; M. J. Rothenberg
JHK and Associates, 4660 Kenmore Ave., Alexandria, Va.
22304
Contract DOT-FH-11-8242
Rept. No. FHWA-RD-77-114; 1977; 90p
Availability: NTIS

HS-021 866

**AUTO FUEL ECONOMY. HEARINGS BEFORE THE
SUBCOMMITTEE ON SCIENCE, TECHNOLOGY,
AND SPACE OF THE COMMITTEE ON
COMMERCE, SCIENCE, AND TRANSPORTATION,
UNITED STATES SENATE, NINETY-FIFTH
CONGRESS, FIRST SESSION, JULY 12 AND 14, 1977**

The Subcommittee on Science, Technology, and Space of the U.S. Senate Committee on Commerce, Science, and Transportation met to consider testimony on implementation of the automobile fuel economy standards mandated by the Energy Policy and Conservation Act and the automobile-related provisions of President Carter's energy program. Statements were presented by representatives of the following organizations: Automobile Importers of America, Inc.; Ford Motor Co.; Congressional Budget Office; American Motors Corp.; Citizens for Clean Air; National Hwy. Traffic Safety Administration; Center for Auto Safety; Chrysler Corp.; and National Automobile Dealers Assoc. Additional articles, letters, and statements are attached to the document. Transcripts of question and answer sessions following some of the testimony are also included.

Rept. No. USS-95-38; 1977; 213p
Availability: GPO

HS-021 867

**MOTOR VEHICLE INSPECTION STUDY FOR THE
STATE OF MARYLAND**

Alternative and optional methods for enforcement of vehicle safety equipment standards and exhaust emission levels were studied in relation to the existing Maryland inspection system. The mechanical condition of all Class A vehicles was determined in terms of safety-related criteria. Level of compliance to exhaust emission limits was studied. The economic feasibility of a periodic motor vehicle inspection program was considered, as well as its effect on air quality and fuel conservation. A random sample of 40,000 vehicles was made of the 1.8 million vehicles listed in Maryland as Class A. Some vehicles had been inspected previously by the existing state inspection system; others had never been inspected in Maryland. All of the 40,000 owners were invited by letter to cooperate by having a free safety inspection; 5881 responded by bringing their vehicles to inspection stations, and an additional 1508 owners were reached by a mobile inspection van. The study showed that the majority of vehicles would not pass an inspection at any given time. These vehicles, which have never been in-

spected in Maryland have a greater probability of passing a subsequent inspection. Inspections as performed in the existing system do tend to identify those vehicles in need of repair, but greater controls and standardization would increase both the number and types of failures in the vehicle population. Age and mileage do relate significantly to the probability that a given vehicle will pass or fail. The majority of vehicles in Maryland would meet imposed emission limits. Vehicle age appears to be the most significant factor in determining amounts of carbon monoxide and hydrocarbon emissions.

Maryland Dept. of Transportation, Motor Vehicle
Administration, Glen Burnie, Md. 21062
1977; 80p 14refs

Cover title: "Periodic Motor Vehicle Inspection. A Report to the 1977 Maryland General Assembly Pursuant to S.J.R.45 (1975 General Assembly)."
Availability: Corporate author

HS-021 868

**CAR-TRUCK FATAL ACCIDENTS IN MICHIGAN
AND TEXAS**

Current estimates of the frequency of underride in car-into-truck accidents were compared with 1970 estimates of 200 annually nationwide by studying all such accidents in Michigan in 1972-1976 and in Texas in 1975 and 1976. Police accident reports of fatal accidents in which passenger cars rear-ended or side-impacted a large truck or tractor trailer were studied; accident scene photographs were analyzed, and available investigation police were interviewed. In each case, relative impact speed was estimated. By averaging the data, the expected annual number of rear-end car/truck fatal collisions is 261, plus 195 side collisions, or a total of 456 nationwide. Projecting only the 1976 data, the total number would be 571. Of the rear-ends, 90% result in underride; of the side impacts, 75% result in underride. Such accidents usually occur at night on straight rural roads; the drivers are usually males, with drinking involvement about the same as that for other types of fatal accidents. Relative impact speeds, especially in side impacts, are usually over 30 mph. Better underride guards with energy-absorbing capabilities and enhanced conspicuity of trucks and trailers would reduce but not eliminate such accidents.

by Daniel J. Minahan; James O'Day
University of Michigan, Hwy. Safety Res. Inst., Huron Pkwy.
and Baxter Rd., Ann Arbor, Mich. 48109
Rept. No. UM-HSRI-77-49; 1977; 45p
Sponsored by Motor Vehicle Manufacturers Assoc., Inc.
Availability: Corporate author

HS-021 869

**THE EXPECTED IMPACT OF THE NATIONAL
ENERGY PLAN ON THE FEDERAL-AID HIGHWAY
PROGRAM**

The likely impact to 1985 of the proposed and emerging National Energy Plan (NEP) on the Federal-aid highway program is assessed by studying such factors as gasoline consumption, state and Federal gasoline tax receipts, timing of the standby gas tax, estimated shortfalls, and highway construction levels. The goals of the NEP include reduction of oil imports to less than 6 million barrels per day, with a 10% reduction in gasoline consumption; growth rate of energy demand of less than 2% per year; increased coal production to 1265 million

include the gas guzzler tax and rebate, gasoline conservation tax, auto efficiency standards, the 55 mph speed limit, standby gasoline tax, expanded use of Hwy. Trust Fund, removal of 10% excise tax on intercity buses, efficiency standards for light-duty trucks, and a Federal energy management program. Domestic price controls are to be reduced and domestic crude prices are to be equalized with global oil prices. A strongly supportive coal conversion policy is included. In NEP(1), the plan would be enacted substantially as proposed; in NEP(2), the Howard amendment's five cents per gallon gasoline tax would replace the standby gasoline tax. The base case assumes that no policy would be enacted but that the fleet fuel economy standards of the 1976 Energy Policy and Conservation Act (EPCA) would be complied with. The Crude Oil Equalization Tax (COET) would increase the real cost of gasoline by 4% per year in 1978 through 1980, resulting in a reduction of the consumption levels of 0.8% in 1978 to 3.48% in 1982. The standby tax would be triggered in 1983 in Scenario A (high travel growth), putting the tax into effect in 1984. Real gasoline costs would increase by 7.0% in 1984 and by 6.5% in 1985, reducing gasoline consumption in 1984 and 1985 by an additional 1.4% and 3.1% respectively. The standby tax would not be triggered under Scenario B (lower travel growth rate) at least through 1985. The EPCA will offer the greatest reduction in consumption when compared to a baseline projection—a total of 15% for the nine-year analysis period. The reduced consumption levels could cause state gasoline tax revenue shortfalls of \$1.8 to \$2.8 billion under NEP(1) and \$2.3 to \$3.1 billion under NEP(2), in addition to the \$12.0 to \$13.2 billion shortfall attributable to EPCA. If increases in state gasoline tax rates keep pace with the rate increases of 1970 through 1975, the state shortfall could be reduced by \$6 to \$7 billion. Federal compensation to states for shortfalls could range from \$1.8 to \$16.3 billion, depending upon definitions and upon interim state tax policies. Federal revenues would be reduced under NEP(1) by \$0.8 to \$1.2 billion in addition to the \$6.3 to \$6.9 billion attributable to EPCA. However, NEP(2) would increase Federal revenue by \$15.3 to \$16.7 billion. State and Federal shortfalls could reduce total highway funds by \$2.7 to \$3.5 billion, reducing capital improvement funds by \$1.3 to \$1.7 billion. With EPCA, total shortfalls could reach \$6.5 billion. However, the direct impact of NEP upon highway construction costs would be very small.

Federal Hwy. Administration
1977; 54p
Availability: Corporate author

HS-021 870

PRELIMINARY FINDINGS ON THE FLEET ACCIDENT EVALUATION OF FEDERAL SAFETY STANDARD 121

Data were gathered on mileage and accident involvements of trucks manufactured between Jan 1974 and Jan 1976, before and after Federal Motor Vehicle Safety Standard (FMVSS) 121, Air Brake Systems, became effective in Mar 1975. Vehicle types studied included straight trucks, tractors, and school buses. Data were obtained from records maintained on a sample of fleets selected nationally by statistically based sampling techniques; such information included exposure or mileage, accidents, and maintenance. The number of accident reports received was much lower than expected. Supplemental data were incorporated from a census of all fatal accidents in the

Fatal Accident Reporting System (FARS). Telephone interviews concerning these accidents yielded additional information. Also used were injury accidents reported to the Bureau of Motor Carrier Safety by authorized carriers. The data for the calendar year 1976 show a slightly lower rate of accident involvements, on a per mile basis, for the 121-equipped vehicles, along with substantially more frequent maintenance. However, the differences are not statistically significant. The accident rates were down 4% for tractors, 21% for straight trucks, and 59% for school buses. However, there was a total of only 268 accidents, of which only about 30% involved straight trucks or school buses.

by Kenneth L. Campbell
Publ: HRSI Research Review v8 n2 p1-11 (Sep-Oct 1977)
1977
Based on interim report, "Fleet Accident Evaluation of FMVSS 121," Sep 1977.
Availability: See publication

HS-021 871

APPLICATION OF THE UTCS-1 NETWORK SIMULATION MODEL TO SELECT OPTIMAL SIGNAL TIMINGS IN A MULTI-LINEAR STREET SYSTEM. INTERIM REPORT

A computer model capable of simulating automobile traffic on an urban roadway is demonstrated. The model was based on the UTCS-1 network flow simulation model. Signals were retimed to provide for better traffic flow. Measures of effectiveness used in comparing alternatives included network average speed, carbon monoxide emissions, fuel efficiency, delay, and stops per vehicle trip. Major and minor street delay was also considered. Fuel efficiency and carbon monoxide emissions were related to each other, and the effects of cycle lengths on network operation were also studied and analyzed. The model is valid in that it accurately replicates the flow of traffic along a signalized arterial, given the necessary description of the traffic stream and roadway. A detailed manual is appended for data encoding, as is a sample simulation run. A regression equation was used to estimate fuel consumption rate using network average speed as the independent variable. Regression equations using fuel consumption to predict the emissions of carbon monoxide were developed by utilizing an Environmental Protection Agency modal analysis emissions model. As cycle length decreased, measures of effectiveness improved. The delay/difference of offset technique consistently produced higher network average speeds and less delay over a range of cycle lengths when compared with an unimproved, signalized arterial. A systematic approach is necessary for the proper timing of traffic signals whether dealing with several signalized intersections or with an isolated intersection. A detailed study should be conducted before initiation of a specific signal system, particularly if it includes added or deleted phases. Once a particular signal timing system has been implemented, corrective action or updating should not be neglected. Familiarity with the street system to be timed is necessary, and motorists' complaints about signal timing should be taken into account. A worthwhile addition to the model would be a routine that higher acceleration noise generally denotes an increase in the probability of accidents; a

measure of effectiveness relative to safety would be a worthwhile addition.

by Raymond N. Carini, Jr.
Purdue Univ., Joint Hwy. Res. Proj., West Lafayette, Ind.;
Indiana State Hwy. Commission
Rept. No. JHRP-77-19; 1977; 182p 60refs
Availability: Purdue Univ., West Lafayette, Ind.

HS-021 872

TRAFFIC SPEED REPORT NO. 102. INTERIM REPORT

Observations of spot speeds were taken on interstate, four-lane, and two-lane Indiana highways during Jul-Sep 1977 to determine overall average speeds. Measurements were taken by radar speed meter from a van disguised as a disabled vehicle so as not to influence the monitored speeds. CB radio was also monitored so that measurements would not be taken when drivers were warning each other of possible speed traps by CB. Overall average speeds for all vehicles and passenger cars were 57.5 mph and 57.8 mph respectively, which are 0.6 mph and 0.3 mph respectively below the averages for the preceding quarter and are 0.1 and 0.2 mph respectively below those for the same quarter of the preceding year. Overall average speeds for all trucks and heavy trucks were 57.0 mph and 57.4 mph respectively, which compare with the previous quarter as 1.0 mph and 1.2 mph lower, respectively, and with the same quarter of the previous year as the same and 0.3 mph lower, respectively. The 85th percentile speed of passenger cars decreased by 0.4 mph to 62.6 mph in comparison with that of the preceding quarter and by 0.1 mph in comparison with the same quarter of the preceding year. Compared with Aug 1976 data, the average speed of passenger cars decreased for the two-lane highways by 0.7 mph and for the four-lane highways by 0.1 mph, and increased slightly for rural interstate highways by 0.2 mph. Truck average speed is less for the two-lane highways by 1.3 mph and for the four-lane highways by 0.2 mph, but slightly higher for rural interstate by the 0.9 mph. Nighttime speeds on rural highways were very similar to daytime speeds.

by J. R. Mekemson; G. K. Stafford
Purdue Univ., Joint Hwy. Res. Proj., West Lafayette, Ind.
Contract HPR-1(15)-Pt-1
Rept. No. JHRP-77-18; 1977; 79p
Conducted in cooperation with the Indiana State Hwy.
Commission and the Federal Hwy. Administration. Rept. for
Jul-Sep 1977.
Availability: Corporate author; NTIS

HS-021 873

FATAL ACCIDENT REDUCTION ENFORCEMENT PROGRAM (FARE). FINAL REPORT

The Fatal Accident Reduction Enforcement Prog. (FARE) was designed to reduce fatal traffic accidents occurring on the state and county highway systems under the jurisdiction of the 53 participating areas of the California Hwy. Patrol by an overall total of 5% below the preceding three-year average. The program involved selective enforcement of primary collision-causing violations during times and at locations where a high frequency of fatal accidents either had occurred or might occur. Additional enforcement was made of laws relating to driving under the influence of alcohol and/or drugs. The operational periods were the Labor Day and Thanksgiving holiday

periods and the weekends preceding the 1973 Christmas and New Year holidays. Overall reduction of fatal accidents was 25.7%; total arrests increased 10.4% and arrests for drunk driving increased 47.4%. Fatal accidents in the remainder of California increased overall by 28.1%, and in the California Hwy. Patrol areas not participating in the program, by 39.5%. The reduction in fatalities represents a savings to society of \$9,352,000, in comparison with the \$453,196 spent by the program. Attached are statistics for the four holiday periods, including data on the following: fatal accidents by area; fatalities by area; injury accidents by area; the preceding facts by hour of day and by day of week for each area; fatal and injury accidents by shift and by holiday period; primary collision factors in both types of accidents; fatal accidents during FARE and non-FARE shifts; arrests and drunk driving arrests in 1970-1973; total FARE arrests and drunk driving arrests by hour of day and day of week; and FARE enforcement hours by day of week and by shift. Additional data appended include statistics for the non-FARE areas and data on vehicle miles of travel and statewide precipitation, the program's operation plan, and news releases.

Department of California Hwy. Patrol
1974; 311p
Supported by State of California Office of Traffic Safety and
by National Hwy. Traffic Safety Administration.
Availability: Corporate author

HS-021 875

MOTORCYCLE SAFETY EDUCATION AND TRAINING. FINAL REPORT

A project to reduce motorcycle collisions trained 883 teenage motorcycle riders from 1 Sep 1973 to 31 Aug 1974 to ride skillfully and to think defensively. Students from six Fresno, Calif., high schools participated in Saturday training sessions led by specially trained instructors from the California Hwy. Patrol and using donated Kawasaki 100 cc enduro type motorcycles. The lesson plan developed and used is appended. The program was opened to any interested student between 15 and 18 years of age. The more difficult practice exercises were eliminated since there was insufficient time to train each student to do all exercises individually; in the case of an exercise in braking efficiency, instructors substituted a demonstration. The course included both a dirt portion and an asphalt portion. Insufficient time was allocated for registration, student evaluation, and testing. Of the students, 100 or 11.3% were selected for testing both before and after participation in the course to determine its effectiveness. Whereas 84% did not demonstrate sufficient skills necessary to qualify as Class 4 operators before taking the training, 100% did so after participation. Both students and parents who observed the training sessions evaluated the program and its instructors as excellent. Of the 883 students who received training, 72 were allowed to repeat the course for additional training, 860 were certified and 23 were not, and four were suspended for failure to follow specific safety rules after being warned, or for performance of unsafe and unnecessary acts of exhibition. Problems encountered in the program were student recruitment (licensed operators did not show interest in attending), the original evaluation design which did not allow for a satisfactory control group, and ad-

ministrative requirements which far exceeded original time estimates.

California Hwy. Patrol
1975; 108p
Funded by National Hwy. Traffic Safety Administration,
Office of Traffic Safety.
Availability: Corporate author

HS-021 887

DYNAMOMETER TEST PROCEDURES FOR THREE-WAY CATALYST SCREENING

A testing procedure for three-way catalysts has been developed which permits catalysts to be aged and screened on an engine dynamometer. The accelerated aging cycle is a modified AMA cycle with four times the number of high speed acceleration (peak temperature) modes as in the standard cycle. Testing consists of the measurement of hydrocarbon, carbon monoxide, and oxides of nitrogen conversion as a function of A/F with superimposed perturbations which simulate limit cycle variations of A/F in a closed-loop fuel control system. The A/F range scanned was 14.0 to 15.2. Such conventional analytical methods as chemiluminescent optical detector, FID, and NDIR were used to measure the exhaust gas composition before and after the catalyst. The net conversion efficiency of oxides of nitrogen was measured by the following system: three-way catalyst-air-oxidation catalyst. The ranking of three-way catalysts on the basis of conversion efficiency is found to be consistent, for the emissions studied, between dynamometer measurements with periodically perturbed A/F and CVS-CH testing on a vehicle. Alternatively, conversion efficiency curves as a function of the nonperturbed A/F do not realistically reflect three-way catalyst vehicle performance.

by M. E. Heyde; M. K. Adawi; D. H. Anderson; M. P. Schroeder; R. G. DeLosh
Ford Motor Corp.
Rept. No. SAE-770371; 1977; 8p 2refs
Presented at International Automotive Engineering Congress and Exposition, Detroit, 28 Feb-4 Mar 1977.
Availability: SAE

HS-021 889

BICYCLE SAFETY: A PROGRAM OF IMPLEMENTATION AND STUDY. FINAL REPORT

A comprehensive program of bicycle traffic law enforcement was developed and implemented which included a training film and an enforcement procedure suitable for handling the young violator. Bicycle safety presentations were made in the Santa Barbara, Calif., junior high schools, bicycle rodeos were sponsored by the police department and local service organizations, and ten media spots were made to publicize the bike safety issue. A study made to establish the minimum age for bicyclists incorporated pertinent psychological and physiological data of the child's ability accurately to perceive and comprehend basic traffic laws, expert opinion, and a survey of parental acceptance. Recommended legislation includes the following provisions: that no child under the age of nine years be permitted to ride a bicycle on a public street unless accompanied by and under the supervision of an adult; that children between the ages of 9 and 16 years may ride bicycles on public streets without the accompaniment of an adult only

level of knowledge of traffic laws and ability to recognize hazards; and that such children have a permit issued by the Dept. of Motor Vehicles. Existing bicycle safety films and courses were reviewed, and a bicycle safety game was developed using wide-angle slides of traffic environment scenes. The game was incorporated into a program of bicycle safety education along with films and a variety of other teaching aids. An accompanying instructor's manual was developed. The bicycle law enforcement effort was considered successful since there was an overall reduction of observed violations from 55% to 21%. The reduction did not, however, result in a reduction of bicycle/motor vehicle accidents: such accidents have increased, perhaps because of an increase in bicycle traffic density.

City of Santa Barbara, Transportation Div.
1975; 56p
Supported by State of California, Office of Traffic Safety, and by the National Hwy. Traffic Safety Administration.
Availability: Corporate author

HS-021 897

FAST BONDING CUTS AUTO COSTS

A new inductive heating technique for fast bonding of relatively thin metallic parts to nonmetallic components with heat-activated adhesives is characterized by a uniform heat distribution within sharply defined boundaries and by unique, precisely controlled temperature sequences. A U-shaped core of low-loss material is used which is terminated by a part of the ferromagnetic material to be heated; the two together form a closed magnetic circuit. The technique can be used for fastening of plastic retainer clips, the bonding of the manufacturer's identifying logo to the car's body, and the bonding of metallic fastening clips to the curved surfaces of glass windows and to the automobile's plastic grill. The problem of the finite thermal time constant of the paint layer is overcome by a scheme involving two discrete temperature levels at the outer surface. A number of studs can be bonded to a window in a single operation since inductive heating brings the studs to the activation temperature at the same instant. The technique was primarily developed for the demanding time constraints of the automobile assembly line.

by Eugene Mittelmann
Publ: IEEE Spectrum v14 n11 p73-5 (Nov 1977)
1977; 2refs
Availability: See publication

HS-021 898

UNJAMMING TRAFFIC CONGESTION

Computer-based traffic signal control systems determine actual traffic patterns, compare them with patterns developed offline and stored in the computer, and then select a signal-timing plan corresponding to the closest pattern match. The result is speeding of the traffic flow with consequent shortening of delays, improvement of fuel economy, and lessening of air pollution. Over 25 such systems are currently operating in U.S. urban areas, including Louisville, Ky., and New York, N.Y. Next-generation schemes, still experimental, would generate timing plans online by calculating the following parameters: split, or proportion of green time given competing approaches to an intersection; offset, or time delay as green lights flash on

reduce the cost of communications hardware. Prototype controllers based on microprocessors are in use; microprocessors can also be used by detecting devices. Other computerized systems of controlling traffic include the New Jersey Turnpike system that manages traffic flow by opening and closing ramps and lanes as needed, and that detects problems on the roadway. The National Emergency Action Radio (NEAR) is a government-sponsored program that monitors citizen-band channels set aside for information concerning motorists in distress. In Germany, FM radio is used to transmit traffic information to drivers. In both Germany and Japan, systems are in use which provide front-panel display of traffic information in the individual vehicles.

by Edward A. Torrero
Publ: IEEE Spectrum v14 n11 p77-9 (Nov 1977)
1977
Availability: See publication

HS-021 899

TOWARD SAFER MOTOR VEHICLES

Highway safety in the U.S. is reviewed in terms of the public demand, governmental programs, recent developments in vehicle equipment and training, and roadway improvements. The National Safety Council estimates that almost 90% of automobile accidents are caused by human error. The National Hwy. Traffic Safety Administration (NHTSA) performs basic research in highway safety and legislates through its Federal Motor Vehicle Safety Standard (FMVSS) program. NHTSA is assisted by the National Hwy. Safety Advisory Com. Safety efforts deal with both crash avoidance and crashworthiness of vehicles; examples of the latter are the Experimental Safety Vehicle (ESV) and Res. Safety Vehicle (RSV) programs. There has been much debate over the use of passive restraints in vehicles. Federal Hwy. Safety Prog. Standards deal with the physical design and the operational aspects of the roadway. Graphed and tabulated data presented include the following: annual death rate by vehicle miles; 1975 accident distribution by vehicle type; frequency and cost of automobile injuries; typical standard safety features available on late-model automobiles; the RSV's by Calspan and Minicars; and advanced automobile electronics capabilities.

by Ronald L. Braun
Publ: IEEE Spectrum v14 n11 p81-6 (Nov 1977)
1977
Availability: See publication

HS-021 900

AUTOS AND PUBLIC TRANSIT: FRIENDS OR FOES?

What role public transportation should play in the U.S. transportation system is debated, and the thesis advanced that the advantages of both private and public modes of transportation should be combined to form a balanced system. The Transportation Systems Div. of General Motors Corp. feels that the purpose of public transportation systems is to provide service for those who cannot or prefer not to use private vehicles, rather than to woo away the user of private vehicles. Urban

the use made of such public vehicles. Although reduction of congestion is usually associated with use of public transportation, it seems that congestion is a self-limiting factor. Estimates of the cost of increasing the use of public transit by 1990 by changing some private trips to public trips include the following: 6.5% total trips for \$55 to \$60 billion; 10% urban trips for \$65 to \$70 billion; and an additional 5%-10% for \$120 billion by using existing technology. Attracting 25% of 1990 trips to public transportation will require \$250 billion in 1976 dollars; expected expenditure by the Federal government between 1977 and 1990, however, is less than \$65 billion.

by Gadi Kaplan
Publ: IEEE Spectrum v14 n11 p89-91 (Nov 1977)
1977; 7refs
Availability: See publication

HS-021 901

THE CONSUMER AND THE AUTOMOBILE

It is difficult for the domestic automobile industry to predict accurately what the public will want to buy. The consumer does not buy what he does not want, but he does not always buy what's best for him. The industry is unfairly castigated for not building smaller and lighter cars; the fuel crisis could not have been foreseen. The public's sudden interest in smaller cars at that time has since waned. All forms of energy should be allowed to seek their true market price. Industry's capabilities may well be diluted by lack of public understanding of the problems.

by Gertrude I. McWilliams
Publ: IEEE Spectrum v14 n11 p93-5 (Nov 1977)
1977
Availability: See publication

HS-802 438

NATIONAL TRAINING COURSE: EMERGENCY MEDICAL TECHNICIAN, PARAMEDIC. INSTRUCTOR'S LESSON PLANS. MODULE 1. THE EMERGENCY MEDICAL TECHNICIAN, HIS ROLE, RESPONSIBILITY, AND TRAINING

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the role and activities of the EMT, the laws governing his function, orientation to the training program, and issues concerning the health professional. Each unit contains a list of knowledge objectives, instructor activities, equipment and materials, content outline, and summary. Unit 4 includes an outline for a practice session.

National Hwy. Traffic Safety Administration
1977; 25p
Availability: GPO Stock No. 050-003-00280-1

HS-802 439

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 2.
HUMAN SYSTEMS AND PATIENT ASSESSMENT**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses medical terminology, human systems (anatomy and physiology) with emphasis on their functions, and the skills needed for obtaining a patient's history and for primary and secondary assessment of a patient's condition. Clinical experience is provided in an emergency department, an intensive care/coronary care unit, a morgue, and a mobile intensive care unit. Each section (unit) outlines knowledge and/or skill objectives, instructor and student activities, equipment and materials, and content scope. A summary is sometimes provided. Also included are demonstration outlines, guides for practice sessions, and checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 103p
Availability: GPO Stock No. 050-003-00281-0

HS-802 440

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 3.
SHOCK AND FLUID THERAPY**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses fluids and electrolytes, blood and its components, disorders of hydration, shock, techniques of management, and clinical experience in an emergency department, in an intensive care/coronary care unit, and with an IV team. Each section (unit) outlines knowledge and/or skill objectives, instructor and student activities, equipment and material, scope of content, and summary. Demonstration outlines are provided for venipuncture by several different methods, for terminating an intravenous injection, for removal of an air embolism from tubing, for drawing blood samples, and for application of military antishock trousers (MAST). Practice session outlines are also included, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 98p
Availability: GPO Stock No. 050-003-00282-8

HS-802 441

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 4.
GENERAL PHARMACOLOGY**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses drug information such as sources, terminology, forms in which drugs are dispensed, drug action (therapeutic, physiological, cumulative) and tolerance, effect on the autonomic nervous system of alpha and beta agents, and essential knowledge required before using a drug. This module also discusses weights and measures, administration of drugs and techniques

of administration. Clinical experience is outlined for calculating drug dosages and for intramuscular and subcutaneous injection. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline, and usually a summary. Demonstration outlines are provided for withdrawing a solution in a vial or an ampule, for using a bolus and prepackaged syringe, for administering an IV push (IV bolus), for addition of drugs into an IV bottle or bag, and for subcutaneous and intramuscular injections. Outlines are provided for practice sessions, with check lists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 80p
Availability: GPO Stock No. 050-003-00283-6

HS-802 442

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 5.
RESPIRATORY SYSTEM**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the anatomy and physiology of the respiratory system, assessment of a patient's specific pathophysiology by auscultation, percussion, and palpation, the problems of respiratory distress and their management, and techniques of management by oxygen administration, by use of adjuncts such as airways and masks, by use of a demand valve, by suctioning, by use of nebulizers, by direct laryngoscopy, and by endotracheal intubation. Outlines are provided for clinical experience in an intensive care unit, in an operating room, and in a morgue. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline, and a summary. Demonstration outlines are provided for inspection, percussion, and palpation of the chest, auscultation of lung sounds and removal of a foreign object, as well as for the above-mentioned techniques for management of respiratory distress. Demonstration outlines are also provided for such optional skills as use of the esophageal obturator airway, use of a positive-end expiratory device, chest decompression, cricthyroidotomy and transtracheal jet insufflation. Guides for practice sessions in each technique are provided, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 140p
Availability: GPO Stock No. 050-003-00284-4

HS-802 443

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 6.
CARDIOVASCULAR SYSTEM**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the anatomy and physiology of the cardiovascular system, assessment and pathophysiology of the cardiac patient, reading and understanding a normal electrocardiogram (EKG), recognition of arrhythmias, and techniques of management of arrhythmias by cardiopulmonary resuscitation (CPR), by EKG monitoring, by defibrillation and cardioversion, by rotating

ties, equipment and materials, content outline, and a summary. A description is given for a demonstration of the cardiovascular effects of various drugs on a dog, as well as outlines for demonstrations of EKG monitoring, carotid massage, defibrillation, intracardiac injection, and use of mechanical CPR devices. Practice sessions are outlined for CPR, for EKG monitoring and carotid massage, and for defibrillation, cardioversion, and use of mechanical CPR devices, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 163p
Availability: GPO Stock No. 050-003-00285-2

HS-802 444

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 7.
CENTRAL NERVOUS SYSTEM**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the anatomy and physiology of the central nervous system, assessment of patients with neurological problems, the pathophysiology and management of these problems, and the techniques of management in cases of coma, seizures, status epilepticus, stroke, and transient ischemic attacks. Causes of these problems are classified as head trauma, spinal injury, and medical problems. Demonstration outlines are provided for application of traction, cervical collar, spinal survey of a conscious and an unconscious victim, and use of the long and short spine board. Review demonstrations are outlined for log roll of a patient on a long spine board, straddle slide, and use of orthopedic stretchers. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline, and a summary. Guides are provided for practice sessions for the demonstrated techniques, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 86p
Availability: GPO Stock No. 050-003-00286-1

HS-802 445

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 8. SOFT
TISSUE INJURIES**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the anatomy and physiology of the skin, patient assessment for soft-tissue injuries, the pathophysiology and management of these injuries, and management techniques, with special consideration of injury to specific areas such as eye, nose, throat, neck, and abdomen. Demonstration outlines and guides for practice sessions are provided for dressing and bandaging, for controlling external hemorrhage, for dressing and bandaging impaled objects, amputations, and avulsions (other than

ties, equipment and materials, content outline, and a summary. A description is given for a demonstration of the cardiovascular effects of various drugs on a dog, as well as outlines for demonstrations of EKG monitoring, carotid massage, defibrillation, intracardiac injection, and use of mechanical CPR devices. Practice sessions are outlined for CPR, for EKG monitoring and carotid massage, and for defibrillation, cardioversion, and use of mechanical CPR devices, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 98p
Availability: GPO Stock No. 050-003-00287-9

HS-802 446

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 9.
MUSCULOSKELETAL**

This module of a guide for teaching an advanced-level training program for emergency medical technicians (EMT) discusses the anatomy and physiology of the major bones, joints and muscles of the body, patient assessment for fractures, dislocations, strains and sprains, pathophysiology and management of these problems, and management techniques using the various available splinting devices. Clinical experience is outlined in an emergency department. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline and a summary. Demonstration outlines are provided for immobilization of a suspected fracture or dislocation of shoulder or clavicle, immobilization of an injured extremity, and management of rib fractures (review). Practice session guides are given for use of an air splint, a padded board splint, a pillow, and a Hare traction splint, for immobilization of an injured shoulder or clavicle, and for immobilization of an injured joint. Checklists are included for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 64p
Availability: GPO Stock No. 050-003-00288-7

HS-802 447

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 10.
MEDICAL EMERGENCIES**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses diabetic emergencies, anaphylactic reactions, exposure to environmental extremes, alcoholism and drug abuse, poisoning and overdose, acute abdominal problems, genitourinary problems, geriatric emergencies, aquatic emergencies, and management techniques such as nasal tube insertion and urinary catheterization. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline and usually a summary. A demonstration outline and practice session guide are provided for nasogastric tube insertion, with checklist for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 97p
Availability: GPO Stock No. 050-003-00289-5

HS-802 448

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 11.
OBSTETRIC/GYNECOLOGIC EMERGENCIES**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the anatomy and physiology of the female reproductive system, patient assessment, pathophysiology and management of gynecologic and obstetric emergencies, and techniques of management. Demonstration outlines are provided for normal delivery, for infant cardiopulmonary resuscitation, and for complications and abnormal deliveries. Among the topics discussed are gynecological disorders, care and transportation of the mother and child, breech births, prolapsed cord, multiple births, care of premature infant, definition and stages of labor, postpartum and antepartum hemorrhage, ruptured uterus, inverted uterus, and infant resuscitation. Clinical experience is outlined, to be accomplished in the labor/delivery suite. Each unit contains a list of knowledge or skill objectives, instructor activities, equipment and materials, content outline, and usually a summary. A guide for a practice session is provided in managing normal delivery, breech birth, prolapsed cord, and arm or leg presentation. Checklists are included for skill evaluation in practice and in clinical experience.

National Hwy. Traffic Safety Administration
1977; 76p
Availability: GPO Stock No. 050-003-00290-9

HS-802 449

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 12.
PEDIATRICS AND NEONATAL**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses variations in performing pediatric patient assessment and the role of parents, recognition and management of such emergencies as respiratory problems, the sudden infant death syndrome, seizures, and the battered child. Also discussed are techniques of management, such as cardiopulmonary resuscitation, endotracheal intubation, and initiating intravenous therapy on a pediatric patient. A training program for EMT's who are to be involved in neonatal transport is briefly discussed. Clinical experience is outlined, to be accomplished in a pediatric unit. Checklists are provided for skill evaluation. Each section (unit) contains a list of knowledge and/or skill objectives, instructor activities, equipment and material, content outline, and usually a summary. Demonstration outlines and practice session guides are provided for infant resuscitation and endotracheal intubation on an infant, with checklists for skill evaluation.

National Hwy. Traffic Safety Administration
1977; 58p
Availability: GPO Stock No. 050-003-00291-7

HS-802 450

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 13.
MANAGEMENT OF THE EMOTIONALLY
DISTURBED**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses emotional aspects of illness and injury, patient assessment, psychiatric emergencies such as depression, suicidal behavior, paranoid reactions, phobias, disorganization and disorientation, and techniques of management. Types of local resources available are described, with methods for using these resources. Clinical experience is outlined, to be accomplished in a psychiatric unit. Each section (unit) contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, and content outline. A demonstration outline and practice session guide are provided for restraint of a violent patient, with a checklist for skill evaluation. Checklists are also provided to evaluate skills learned in clinical experience.

National Hwy. Traffic Safety Administration
1977; 52p
Availability: GPO Stock No. 050-003-00292-5

HS-802 451

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.
INSTRUCTOR'S LESSON PLANS. MODULE 14.
RESCUE TECHNIQUES**

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) defines the role of the EMT with reference to the basic extrication and rescue skills needed for recognition and management of hazardous environments, gaining access to the patient, correcting immediate life threatening condition, disentangling the patient, preparation for removal, removal, and continued care in transport. The required level of rescue training varies with locale and the entire local emergency-response system. Among the recommended skills are patient carries and lifts such as fireman's carry, fireman's drag, pack-strap carry, extremities carry, seat carry, traction blanket lift, and two-man lift, all of which are included in the EMT-ambulance training program. Acquiring skill in using transport devices such as orthopedic scoop-type stretcher, portable stretcher, chair stretcher, and Stokes basket is recommended, especially for conditions of rough terrain. Local resources and training materials, advice of fire and rescue personnel and an attached list of references are recommended as aids in planning and implementing an appropriate training program.

National Hwy. Traffic Safety Administration
1977; 13p 14refs
Availability: GPO Stock No. 050-003-00293-3

HS-802 452

**NATIONAL TRAINING COURSE: EMERGENCY
MEDICAL TECHNICIAN, PARAMEDIC.**

INSTRUCTOR'S LESSON PLANS, MODULE 15. TELEMETRY AND COMMUNICATIONS

This module of a guide for teaching an advanced-level training program for emergency medical technician (EMT) discusses the type of equipment involved and describes how the equipment is employed in a systemwide communication network. The Federal Communications Commission (FCC) is described and guidelines are discussed for development of standard operating procedures and protocols. The various phases of the emergency medical services (EMS) communications system are described and the function of each phase is explained. Operation and function of each item of equipment involved in the EMS system are explained. Among the basic radio communication concepts discussed are frequency allocation, very high frequency (VHF) and ultrahigh (UHF) communications, frequency-modulated (FM) and amplitude-modulated (AM) radios, voice communications, and biotelemetry communications. Demonstrations and practice sessions are outlined for the types of radios to be used by the students, such as a mobile transmitter/receiver, a portable transmitter/receiver and a digital encoder. Demonstration and practice are also provided for transmission of patient assessment by mobile transmitter or telemetry transmitter. Checklists are included for skill evaluation. The importance of the dispatch phase of EMS communications is emphasized and the role and responsibilities of the dispatcher are described. Each unit contains a list of knowledge and/or skill objectives, instructor activities, equipment and materials, content outline, and usually a summary.

National Hwy. Traffic Safety Administration
1977; 38p
Availability: GPO Stock No. 050-003-00294-1

HS-802 770

ALCOHOL-IMPAIRED DRIVING LICENSE SUSPENSIONS, AND TRANSPORTATION NEEDS DURING INTOXICATION OR SUSPENSION AMONG ALCOHOLICS

A total of 53 recovered alcoholics, members of Alcoholics Anonymous (AA) in Vermont, completed a questionnaire concerning their experiences of alcohol-impaired driving, license suspension and revocation experiences, and opinions regarding transportation assistance and other countermeasures. Almost half of those who had been stopped by police but not arrested felt that the police had not been aware of the intoxication. Of those who reported crashes, only one fifth of the crashes had been officially reported as alcohol-related. Only about one in four alcohol-related crashes resulted in a conviction, and only one in every ten resulted in a DWI conviction. Of 51 suspensions or revocations of licenses attributable to use of alcohol, only half were because of driving while intoxicated (DWI) arrests. A variety of arrangements for transportation was made, without noticeable financial difficulty. License suspension had only limited effect in modifying drinking behavior, driving behavior, or driving after drinking. Of the 16 persons who drove while their licenses were suspended, six were stopped a total of 24 times, only 13 of which resulted in charges of driving during suspension. Almost half would be unwilling to accept transportation, while intoxicated, from someone other than a friend or relative. There is general agreement that increased apprehension rates would be of benefit, as would education about alcohol and alcoholism. Transportation assistance and stricter penalties are not considered helpful. Three quar-

ters are willing to help voluntarily as drivers in a transportation assistance program for drunk or license-suspended drivers. The responses of AA members are considered reliable and based on typical experiences, although their assessment of the value of education might be somewhat biased.

by William S. Inghram; Julian A. Waller
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-IV-1; 1971; 35p 4refs
Availability: Reference copy only

HS-802 771

VERMONT ASAP [ALCOHOL SAFETY ACTION PROJECT] ANNUAL REPORT, MARCH 1972

The Vermont Alcohol Safety Action Proj. (ASAP) operated 1 Jul-31 Dec 1971 in four counties containing 43% of the state's population, performing the following activities: public education, driver profile, intensified enforcement, presentence investigation, and therapy. Public awareness of Proj. CRASH has increased, and there has been complete cooperation from the state government and from the Dept. of Motor Vehicles. Techniques for arresting those driving while intoxicated (DWI) have improved; videotapes and audiotapes are being used during the arrests. Processing time of DWI arrests has decreased from an average of 2.5 hours to an average of 30 minutes. The average blood alcohol concentration (BAC) has been reduced from .21 to about .15, with many arrests being made in the .10 to .11 range. The Gas Chromatograph Intoximeter has been established as the approved breath testing device; a crimper is in every car or at least in every outpost. DWI convictions are in excess of 100% above the 1970 rate. News media support has been consistent and favorable. The public has been willing to participate in surveys and roadblocks. Legislators have become more understanding of the need to change legislation to modify the solely punitive features of the law and to become more responsive to individual needs. The need for probation for DWI's has been demonstrated: of a group of 190 cases, 45% were shown to be problem drinkers or alcoholics needing therapy. Therapy has been provided in the form of Alcohol Impaired Drivers Schools (AIDS). Participants have responded favorably, have suggested that the information be incorporated into high school driver education courses, and have requested that the small-group sessions be continued. Problems of the overall ASAP program have included the legislative requirement to suspend the driver's license for one year for conviction of DWI first offense, and the fact that there is virtually no organized alcohol therapy program outside of AIDS.

Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt. 05676
Contract FH-11-7543
Rept. No. Vt:ASAP-Annual-Report-1972; 1972; 237p
Copy includes notes by contract monitor included in pagination.
Availability: Reference copy only

HS-802 772

PREVIOUS POLICE CONTACTS, AND RECIDIVISM AMONG DRIVERS WITH ARRESTS FOR DRIVING

WINE UNDER THE INFLUENCE OF ALCOHOL IN VERMONT--BASELINE DATA

Previous police contacts as well as subsequent recidivism after arrest were examined for 250 persons convicted for driving while under the influence of alcohol (DWI) in Vermont. Measures of recidivism included both highway and nonhighway offenses, including highway crashes, and alcohol and nonalcohol offenses during and after the compulsory one-year or longer period of license suspension. Seventy percent of offenders had had contacts with the police in Vermont previous to their index DWI arrest, and 39% had previous offenses in which misuse of alcohol could be identified. Eighty percent of DWI convictions occurred in less than three months after the DWI arrest, and in 94% license suspension followed conviction within less than another month. There were important exceptions to this pattern however: in one area of the state, 42% of convictions for persons age 30 or older who were tried for a second or subsequent DWI offense took longer than three months, and in those counties suspensions also were likely to be delayed and recidivism during and after suspension occurred more often. Only one out of every four offenders had any contact with the Dept. of Corrections, and even among persons with previous police contacts only one in every fifty underwent presentencing evaluation, a request usually initiated by the court. Overall, over one third of individuals were documented recidivists subsequent to the index DWI arrest (21% among those without previous records and 41% among those with earlier contracts), although it is suspected that many more actually were covert recidivists. Seventeen percent of persons had records of subsequent police contacts during suspension. Among persons with no previous police contacts, 11% were documented recidivists during suspension, whereas 20% were recidivists among persons with previous police contacts; 22% of persons with previous alcohol offenses had subsequent offenses during suspension. Individuals who were single, divorced, or separated had higher offense rates during suspension than did those who were married or widowed; 11% of persons committed additional documented highway offenses during suspension and 8% had nonhighway offenses, again with a marked relationship between previous police contacts and subsequent offenses. Twenty-one percent of individuals were known to be involved with the police during the few months to three years subsequent to completion of their license suspension.

by Julian A. Waller; Linda Flowers
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-V-1; 1972; 56p 6refs
Availability: Reference copy only

HS-802 773

BASELINE DATA FOR PUBLIC EDUCATION ABOUT ALCOHOL AND HIGHWAY SAFETY IN VERMONT

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) gathered baseline data on the following aspects of the driving population prior to beginning its efforts: general demographic information; patterns of use of public information media; driving patterns; use of alcohol and cigarettes; experience with drinking and driving in combinations; attitudes and knowledge regarding alcohol and highway safety, and possible safety measures; attitudes and knowledge regarding problem drinking; and blood alcohol concentration

(BAC) determination. During May and Jun 1971, interviews were made with 109 teenaged males (TAM's) 147 young adult males (YAM's), 133 middle-aged males and all females (MAD's), and 10 persons with previous arrests for driving while intoxicated (DWI's) at 28 roadside sites throughout the state. An additional 14 DWI's were interviewed at home. The media tended not to discuss highway safety and alcohol use in relationship to each other. High-risk drivers, or those who frequently have five or more drinks per sitting, composed 49% of the TAM's, 53% of the YAM's, 75% of the DWI's, and 24% of the MAD's. The typical high-risk driver tends to be a young, high-school educated male in lower occupational classes, to be single, divorced, or separated, and to prefer beer. TAM's and YAM's tend to use automobile-oriented media, DWI's tend to use TV, and MAD's tend to use all conventional media. Only one third of all respondents correctly identified the Vermont presumptive limit. Few understood how to compute BAC's or that typical servings of beer and whiskey contain the same amount of alcohol. High-risk drivers tended to underestimate the dangers of drunk driving and to overestimate their abilities to drive after drinking. One third of low-risk drivers and one half of high-risk drivers did not consider getting drunk on the weekend to be a sign of problem drinking. There was opposition to denying licenses to heavy drinkers, and to special license plates for convicted DWI's. There was support for requiring treatment for problem drinkers and for increased enforcement at high-risk times and places, and for implied consent. Media messages should be low-key and should portray young males who use beer. The most important message to convey is that typical servings of beer and whiskey have equivalent amounts of alcohol. Educational efforts should not promote the Alcoholics Anonymous image of alcoholism but rather the young, prealcoholic image of transient drinking problems which are correctable with outside help.

by Julian A. Waller; John K. Worden; Irvin W. Maranville
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-I-1; 1972; 193p 15refs
For summary, see HS-802 774.
Availability: Reference copy only

HS-802 774

BASELINE DATA FOR PUBLIC EDUCATION ABOUT ALCOHOL AND HIGHWAY SAFETY IN VERMONT. SUMMARY

by Julian A. Waller; John K. Worden; Irvin W. Maranville
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-I-1-Summ; 1972; 12p
For abstract see HS-802 773.
Availability: Reference copy only

HS-802 775

BASELINE DATA FOR POLICE ENFORCEMENT AGAINST ALCOHOL IMPAIRED DRIVING IN VERMONT: ROADSIDE SURVEY REPORT

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) conducted a survey of 524 drivers at 14 roadside interview sites on Thursday, Friday, and

Saturday night to determine drinking patterns and blood alcohol concentrations (BAC's). Sites were chosen because of evidence that they were likely places for heavy alcohol use and subsequent driving. At an additional four sites, both drivers and their passengers were interviewed. Overall, 32% of drivers had positive BAC's, 16% had 50 mg% or higher, and 5% had 100 mg% or higher. Drivers on sparsely or heavily travelled roads had alcohol less often than those on roads with moderately heavy traffic. Males, ages 20-49, and daily heavy drinkers (those who have five or more drinks per sitting) most often had alcohol and had high BAC's. Thus, 79% of daily heavy drinkers had alcohol, 58% had 50 mg% or higher, and 21% had 100 mg% or higher. Light drinkers seldom had alcohol. Only 16% of drivers with 50 mg% or higher had a licensed, unimpaired driver in the car as a passenger and about one half had no passengers. In general, drivers who usually are light drinkers had passengers who are also light drinkers; whereas heavy drinkers more often had heavy drinkers for passengers, especially if both driver and passenger were male.

by Julian A. Waller; Darwin Merrill; Linda Flowers; Irvin W. Maranville
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.

Contract FH-11-7543
Rept. No. CRASH-III-1; 1972; 80p 5refs
Availability: Reference copy only

HS-802 776

A COMPARISON OF POLICE AND MALE DRIVER KNOWLEDGE, ATTITUDES AND BEHAVIORS ABOUT ALCOHOL AND HIGHWAY SAFETY

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) compared the knowledge, attitudes, and behaviors concerning alcohol and alcohol and highway safety of Vermont Dept. of Public Safety Troopers with those of male drivers of similar ages who were interviewed in a roadside research survey. Fewer troopers than drivers are either nondrinkers or frequent medium (three to four drinks per sitting) or heavy drinkers (five or more drinks per sitting); 58% of troopers drink heavily at least monthly but only 10% of troopers, in contrast to 37% of drivers, had had at least 5 drinks in only one or two hours during the previous month. Neither drivers nor troopers were very knowledgeable regarding how many drinks 120 lb and 160 lb persons must consume in order to reach a BAC of 100 mg%. Drivers tend to underestimate the role of alcohol in serious crashes, whereas troopers more often overestimate it. Relatively few in either group identify problem drinkers as the most frequent category of persons in alcohol crashes, and many individuals in both groups are unable to recognize some of the more common behaviors associated with problem drinking. In general, the police were more supportive than driver respondents of countermeasures that would increase their ability to identify, apprehend, convict, and keep track of drivers whose drinking may make them a problem on the highway, but they are less in favor than the general public of measures that might be perceived as watering down the punishment aspect of sentences for convictions for driving while intoxicated (DWI). Troopers who are heavier drinkers appear to be somewhat more lenient than light drinking troopers in considering countermeasures that they would impose on drivers who are heavy drinkers. The average trooper makes five or less DWI arrests per year, with few making more than ten such arrests annually. Many potential DWI arrests end up as arrests for "violation of laws

of the road" or "careless and negligent driving," lesser offenses which do not take as much time for processing and which stand a better chance of ending up with a conviction. Experienced troopers more often follow this pattern. Primary deterrents to DWI arrests when the BAC is above the presumptive limit are lack of other evidence (such as slurred speech or staggering) and perceived or actual lack of support of the officer by the state's attorney, court, or jury. Heavier drinking officers make fewer DWI arrests than do those who are light drinkers. High priority should be given to establishing a per se rather than a presumptive limit of 100 mg% BAC for impaired driving, reducing the time and effort required to make a DWI arrest, providing education to police, state's attorneys, and judges about drinking patterns and their relation to highway safety, and continued effort to increase facilities available to handle problem drinkers.

by Julian A. Waller; John K. Worden
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.

Contract FH-11-7543
Rept. No. CRASH-III-2; 1972; 81p 13refs
Availability: Reference copy only

HS-802 777

DETERMINING STRATEGIES AND EXPECTATIONS REGARDING INCREASED ENFORCEMENT AGAINST ALCOHOL IMPAIRED DRIVING IN RURAL AREAS

The rate of alcohol-related driving arrests made in conjunction with Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) was analyzed to determine the rationale behind the increased enforcement, reasonable enforcement expectations regarding arrests, and possible alternatives to current practices for deploying enforcement personnel. During 1972, eight state troopers covering a four-county area made 23 such arrests during a total of 10,335 patrol hours. The police officer is limited by four factors in his ability to make alcohol-related driving arrests: traffic density, percent of drivers with blood alcohol concentrations of 100 mg% or higher, his ability to identify impairment as drivers pass his station, and the degree of support he receives from prosecutors, judges, and his own superiors in the police department. In rural areas he may be seriously hampered by low traffic density at high alcohol times and by inability to identify impairment because of boredom and other factors. At best, the officer might be able to identify and arrest only one out of every 100 to 200 drivers with blood alcohol concentrations (BAC's) of 100 mg% or higher. The major emphasis in measuring effects of increased enforcement, therefore, must be placed upon achievement of deterrence rather than on whether an increase in the number of arrests has occurred. Shifting the patrol patterns, however, may have some value in improving the efficiency of the police as measured by number of man hours per arrest.

by Julian A. Waller
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.

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Rept. No. CRASH-III-11; 1973; 12p 11refs
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HS-802 778

PRE-CAMPAIGN DATA FOR PUBLIC EDUCATION ABOUT ALCOHOL AND HIGHWAY SAFETY IN VERMONT

A roadside survey of male drivers was made in May 1972 in four areas of Vermont to gather data about knowledge of and attitudes toward drinking and driving, preparatory to the "Beer and Consequences" educational campaign of Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways). A total of 243 young (under 30 years of age) and 245 older males were interviewed at 16 roadside survey sites. Data were gathered on the following topics: demographic information, drinking patterns and blood alcohol concentration (BAC) determinations; sources of messages received concerning alcohol and highway safety; knowledge concerning effects of alcohol; knowledge about alcohol and highway safety; knowledge concerning problem drinking; and attitudes concerning countermeasures to highway losses attributable to alcohol. Of the young males 55% were high risk drivers and 27% were heavy drinkers; of the older males, 28% were high risk drivers and 12% were heavy drinkers. Young males preferred beer, whereas older males showed a much greater diversity of preference. Only 18 of the 488 persons interviewed recalled seeing or hearing a message about Proj. CRASH. Less than 60% recalled an alcohol safety message from a particular source (usually TV spots). Less than one third identified the Vermont presumptive limit of .10%, yet almost one half correctly observed that it takes a 160 lb man about three to five drinks in one hour to reach that limit. Only 15% knew that one beer has as much alcohol as a shot of liquor; almost 20% thought that a shot was the equivalent of four or more beers. About one half knew that only the passage of time achieved sobriety, but less knew the amount of time required. Compared with 25% in the 1971 survey who knew that problem drinkers were the main cause of alcohol-related crashes, 36% in the 1972 survey knew it. The young males were less aware of the symptoms of problem drinking than were the older males. In particular, 65% of the young males thought that getting drunk on weekends only was predominantly a social drinking pattern. Most said that the one thing that would convince them not to drive while intoxicated (DWI) was the desire to avoid a crash, and that the worst thing that could result from a DWI conviction would be license revocation. Methods most frequently suggested of getting drunk drivers off the highway were enforcement and penalties. There were no significant differences between overall populations of test areas on any measure of drinking behavior or knowledge about alcohol safety. Young males are a high priority audience for public education about alcohol safety. Such a campaign should stress that one bottle of beer contains as much alcohol as one shot of liquor, that a wait of one hour per drink is necessary for the impairment to wear off; that the Vermont presumptive limit is .10%, and that such things as alcohol arrests, missed work on Monday mornings, loss of memory when drinking, a wife's complaints about drinking, and heavy weekend drinking are all signs of problem drinking. The public is not very aware of rehabilitation measures available to problem drinkers. Fear of arrest for DWI would probably be a successful campaign theme.

by John K. Worden; Julian A. Waller; Thomas J. Riley; Linda Flowers
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-I-2; 1973; 122p 6refs
Availability: Reference copy only

HS-802 779

THE DEVELOPMENT AND EVALUATION OF THE VERMONT DRIVER EDUCATION PROGRAM IN ALCOHOL SAFETY

Materials for a three-session alcohol safety program designed for high school students in Vermont driver education classes are presented, along with information concerning their development and evaluation. The materials include the text of a ten-page booklet titled "Some Things You May Want to Know about Drinking and Driving," a copy of a 15-page booklet titled "ABC's of Drinking and Driving," the text of a nine-page booklet titled "Drinking and Driving/How Much is Too Much?" and a drink/drive calculator made of heavy paper wheels marked to match blood alcohol concentration (BAC) per drink, according to body weight and number of hours spent drinking. Evaluation of the program was made by testing increase in knowledge of various classes; those which had used the new program, those which had used the new program plus a visit from Proj. CRASH, and those which used the old program. The new program was shown to have been more effective than the old, particularly in the following areas of knowledge: problem drinker as most often responsible for alcohol-related crashes; typical servings of beer and liquor as containing the same amounts of alcohol; perceiving one's own limits; and symptoms of problem drinking. The new program did less well than the old in terms of knowledge of how long a wait is needed to sober up, and neither program did much to increase knowledge of the legal and financial consequences of a conviction for driving while intoxicated (DWI). An average of 58% to 75% of new-program students responded correctly in the post-test, compared with 48%-58% of old-program students. Further research is needed to determine the maximum increase of knowledge possible by teaching such a program.

by John K. Worden; Thomas J. Riley; Julian A. Waller
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
Rept. No. CRASH-I-3; 1973; 92p 11refs
Availability: Reference copy only

HS-802 780

HIGHWAY CRASHES AND ALCOHOL COUNTERMEASURES. INTERIM REPORT

The relationship between fatal injury and property damage crashes and the presence or absence of Vermont's Proj. Crash (Countermeasures Related to Alcohol and Safety on the Highways) activities was studied by analyzing crash data for a baseline period and for the CRASH period (fourth quarter of 1971 and all of 1972). Except for a reduction in the present interim study in the proportion of responsible resident fatalities in the CRASH area, no substantial shift was noted in fatality, injury, or property damage crashes between the baseline and program time intervals or between the CRASH and comparison areas. It is not known whether there was no real change to measure or whether real changes occurred but could not be measured.

Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Contract FH-11-7543
1974; 12p
See also HS-802 781.
Availability: Reference copy only

HS-802 781

HIGHWAY CRASHES AND ALCOHOL COUNTERMEASURES: SECOND INTERIM REPORT

The relationship between fatal injury and property damage crashes and the presence or absence of Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) activities was studied by examining crash data for a baseline period and for the CRASH period (fourth quarter of 1971 through 1973). Except for a reduction in the proportion of responsible resident fatalities and in the proportions of single vehicle property damage crashes on weekend nights in the CRASH area, no substantial shift was noted in fatality, injury, or property damage crashes between the baseline and program time intervals or between CRASH and comparison areas. It is not known whether there were no real changes or whether real changes occurred but could not be measured.

by Julian A. Waller

Vermont Alcohol Safety Action Prog. CRASH
Contract FH-11-7543

Rept. No. Key-Analytic-Study-1; 1974; 13p 1ref

Cover title: "An Analysis of Ultimate Performance Measures to Determine Total Project Impact." See also HS-802 780.

Availability: Reference copy only

HS-802 782

AN ANALYSIS OF ASAP PATROL ACTIVITY

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) intensified enforcement team of Vermont State Troopers was specially trained to patrol sparsely populated, rural areas outside of town boundaries. For the first six months they patrolled evenly by day and by county, but then changed to primarily weekend activity in a four-county test area, for the sake of maximum visibility. The troopers used conventional patrols, monitoring of intersections and of difficult and confusing interchanges, and roadchecks. A mobile van was used as a processing center; other equipment included specially purchased cruisers, audiotape recorders for making records of arrests, and gas chromatograph intoximeters of the Mark II type. During the 1970-1974 time period, there was a reduction in alcohol-related crashes from the baseline period, including a 50% decrease in fatal, alcohol-related single-vehicle crashes. Although the percentage of single-vehicle crashes increased, the proportion of such weekend crashes decreased. As for public awareness, almost everyone interviewed knew something about Proj. CRASH, and there was an increase of from 5% to 9% in those who were deterred from DWI for fear of arrest. There was an increase in the conviction rate after passage of the new legislation (S-60). Arrests for driving while intoxicated (DWI) increased 122% between 1971 and 1973, and an 87% increase in the comparison area, the latter due to use of intoximeters. The incidence of arrest for DWI should remain high even after the special enforcement team is disbanded. The goal for the following year is 3000 arrests or 2% of the driving population. The goal for total DWI processing time is a reduction from 2.5 hours to a maximum of 20 minutes, based on improved technology and an approach in which attempts at debating or reasoning with an alcohol-impaired driver are avoided. It has been concluded that it is not possible to deter an alcohol-impaired person from drinking once he is under the influence: the individual must be con-

victed not to drive before that point (blood alcohol concentration or BAC of 0.07%-0.09%) is reached.

Vermont Alcohol Safety Action Prog. CRASH

Contract FH-11-7543

Rept. No. Key-Analytic-Study-3; 1974; 134p

Availability: Reference copy only

HS-802 783

AN ANALYSIS OF THE IMPACT OF ASAP ON THE TRAFFIC SAFETY SYSTEM

The impact of Vermont's Alcohol Safety Action Prog. (ASAP), known as Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways), was studied by examining the master driving while intoxicated (DWI) file, a baseline sample of 250 persons convicted of DWI, and a second sample of 980 persons arrested for DWI during the operational period prior to passage of S-60 by the Vermont Legislature. Disposition of cases did not change. ASAP area judges began using the suspended jail sentence to impose probations with attendance at CRASH school; judges in the comparison area only very slightly increased their use of this sanction. CRASH had a minimal effect on blood alcohol concentration (BAC) levels, which dropped only slightly among DWI's. The DWI profile shifted slightly in the area of occupation, in an upward direction toward semiskilled; also, the percentage of married persons did decrease somewhat, and there was a substantial increase in the percentage of persons having two or more prior, nonalcohol offenses. There was a substantial decrease in the processing time from offense to conviction, even though the court caseload increased greatly.

Vermont Alcohol Safety Action Prog. CRASH

Contract FH-11-7543

Rept. No. Key-Analytic-Study-4; 1974; 22p

Availability: Reference copy only

HS-802 784

AN ANALYSIS OF DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) as it operated between 1 Jul 1971-31 Mar 1973 is described. Those convicted of driving while intoxicated (DWI) were sentenced immediately, then sentences were sometimes suspended and the individual placed on probation; thus diagnostic activities took place after sentencing rather than before, as in other Alcohol Safety Action Prog. (ASAP) designs. CRASH funded four probation officers and the CRASH school in which therapy and diagnostic activity took place. Those identified as problem drinkers were returned to existing treatment facilities. Upon successful completion of an assigned treatment, full payment of fines and/or the conclusion of the probation order, the person was removed from the caseload. Of those arrested in the ASAP area, 66% were assigned to CRASH probations and were diagnosed for treatment referral. Of the diagnosed population, 26% entered some form of therapy beyond the school. Of those receiving therapy, 73% had been identified as problem drinkers. Passage of S-60 by the Vermont Legislature resulted in a virtual requirement that all persons convicted of DWI go through a CRASH school for education, screening, diagnosis, and referral. An alcohol treatment coordinator was placed in each Mental Health Center. As for reducing recidivism, the

costs about \$40 per person; the fee should be paid by the DWI.

Vermont Alcohol Safety Action Prog. CRASH
Contract FH-11-7543
Rept. No. Key-Analytic-Study-5; 1974; 18p
Availability: Reference copy only

HS-802 785

RECIDIVISM AMONG PERSONS ARRESTED FOR DRIVING WHILE IMPAIRED BY ALCOHOL - INTERIM REPORT NO. 2

The effectiveness of rehabilitation programs on the recidivism rate of those convicted of driving while intoxicated (DWI) in a test area in Vermont was studied by Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways). During a follow-up period of from 9 to 27 months after arrest for DWI, 21% of the 980 persons had one additional highway crash or offense on or off the highway and another 20% had two or more additional crashes or offenses. Persons most likely to get into trouble again were those whose cases were not prossed. It is possible that those least likely were those who were convicted and subsequently assigned to an Alcohol Impaired Drivers School (AIDS), with treatment for problem drinking when appropriate. The not prossed and the DWI/AIDS groups may differ inherently, however, since their recidivism rates also differ for the period between arrest and the conclusion of their cases. Persons convicted of DWI and then assigned to probation did not differ in their subsequent recidivism patterns from those who had a traditional fine and license suspension after conviction. Both of these groups recidivated more often than the AIDS assignees but less often than did persons with not prossed.

by Julian A. Waller; Linda Flowers
Vermont Alcohol Safety Action Prog. CRASH
Contract FH-11-7543
Rept. No. Key-Analytic-Study-6-1974; CRASH-V-3; 1974; 16p
Cover title: "An Analysis of Alcohol Rehabilitation Efforts."
Availability: Reference copy only

HS-802 786

VERMONT ASAP [ALCOHOL SAFETY ACTION PROJECT] ANNUAL REPORT 1974. SECTION I

During the 1974 operating year of Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways), fatal crash data relating to overall effectiveness was disappointing. There was a decrease in slope with only a 20% probability that it occurred by chance alone. The decrease occurred in the nontargeted subset of daytime. The same holds true for comparison of single vehicle with multivehicle crashes. Weekend and fatal accidents showed essentially no change in the test area, whereas the comparison area experienced a significant negative drift during the project period. As for injury crash data, there was no cross correlation between enforcement activity and injury accidents corresponding to special enforcement patrol hours. The nontargeted daytime injury accidents showed a significant decrease in slope, not reflected in its nighttime counterpart. During

energy crisis. There was an initial 27% decrease in blood alcohol concentrations (BAC's) from baseline, as measured by roadside surveys, but BAC's did return to baseline levels. BAC's of the comparison area were higher, however. Either it is too soon to measure the effectiveness of Proj. CRASH on behavior patterns or the potential client base for the Alcohol Safety Action Proj. (ASAP) is much larger than ever imagined. The public education campaign seems to have been successful. New materials for high school driver education classes were widely used. A film was produced and distributed which presents five case studies of drinking drivers. A clearinghouse was established which published a Quarterly Resource Guide. There was a downward trend of DWI arrests, perhaps due to disbanding of the special enforcement team and confusion in the courts over the per se provision of the new law. The contract was modified to extend operations through Jun 1975.

Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt. 05676
Contract FH-11-7543
Rept. No. Annual-Report-1974; 1975; 40p
Availability: Reference copy only

HS-802 787

VERMONT ASAP [ALCOHOL SAFETY ACTION PROJECT] 1974 ANNUAL [REPORT] APPENDIX H, TABLES

Tabulated data are presented on a quarterly basis for the following aspects of the Vermont Alcohol Safety Action Proj.: total project impact on both fatal and injury-producing crashes involving single vehicles, multiple vehicles, and pedestrians; blood alcohol concentration (BAC) data for drivers killed and for drivers arrested for alcohol-related offenses; enforcement patrols both regular and ASAP; judicial disposition of alcohol-related traffic arrests and background investigation activity; rehabilitation status report; diagnosis and review activities; driver license record review; summary of public information and education activities; and financial and personnel data for the various programs.

Vermont Alcohol Safety Action Proj.
Contract FH-11-7543
Rept. No. Annual-Report-1974-App-H; 1975; 114p
Availability: Reference copy only

HS-802 788

EVALUATION OF A PROGRAM TO REDUCE RECIDIVISM AMONG PERSONS ARRESTED FOR DRIVING WHILE IMPAIRED BY ALCOHOL IN VERMONT - FINAL REPORT

One aspect of the Vermont Alcohol Safety Action Proj. (ASAP) known as Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) was a program to reduce recidivism among drivers arrested for driving while intoxicated (DWI) by identifying those who were problem drinkers or alcoholics and referring them to treatment. Persons arrested for DWI in the comparison area of the state were used as a control group. An Alcohol Impaired Drivers School (AIDS) was established to educate and evaluate those convicted of DWI,

to motivate them to reduce recidivism, and, where warranted, to motivate seeking of professional help for alcoholism as such help became available. Recidivism was defined as any arrests whether on or off the highway, any crashes or traffic citations during a period of license suspension, and any highway or nonhighway arrests or highway crashes involving alcohol at a time when a suspension was not in effect. Slightly over one half the persons with DWI arrests had blood alcohol concentrations (BAC's) under .20%, one fourth had higher than .20%, and one fifth refused to have a test performed. Over one half had previous offenses at the time of their index arrest, and slightly over one half who were evaluated were found to be problem drinkers. There was a strong relationship between previous offenses and a diagnosis of problem drinking and a somewhat weaker relationship between a high BAC or refusal of test and diagnosis of problem drinking. About 25% of persons recidivated during suspension, with higher recidivism rates among those who had previous offenses, a diagnosis of problem drinking, or both. Persons assigned to AIDS had substantially less recidivism than did persons who had charges not pressed or reduced or who were convicted for DWI and assigned to probation. They did slightly better than persons with DWI convictions but no special assignment. The pattern of less recidivism for AIDS assignees, however, began during the period between arrest and conviction, i.e. before assignment to the particular administrative groups. When recidivism was examined controlling for group characteristics and administrative groups simultaneously, no differences in recidivism could be found between persons assigned to AIDS and those in other administrative categories. This failure of the AIDS program to reduce recidivism was due to the problems of implementation and referral, rather than to the hypotheses on which the rehabilitation effort was based.

by Julian A. Waller; Linda Flowers
Project CRASH, Vermont Dept. of Mental Health,
Montpelier, Vt.
Contract FH-11-7543
Rept. No. CRASH-V-3; 1975; 42p 4refs
Availability: Reference copy only

HS-802 789

AN ANALYSIS OF ASAP PATROL ACTIVITY

Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) intensified enforcement team of Vermont State Troopers was specially trained to patrol sparsely populated, rural areas outside of town boundaries. For the first six months they patrolled evenly by day and by county, but then changed to primarily weekend activity in a four-county test area, for the sake of maximum visibility. The troopers used conventional patrols, monitoring of intersections and difficult and confusing interchanges, and roadchecks. A mobile van was used as a processing center; other equipment included specially purchased cruisers, audiotape recorders for making records of arrests, and gas chromatograph intoximeters of the Mark II type. During the 1970-74 time period, there was an overall drop of injury crashes of 24%. Although there was an overall increase in single-vehicle crashes of from 48% to 60%, the rate during primary CRASH patrols (weekend, nighttime) decreased by 23%. Although the cost of DWI arrests and convictions declined as experience and efficiency increased, the special enforcement team approach is expensive. Combining enforcement and deterrence through increased public awareness and contact was encouraged. A survey of public awareness showed that almost everyone knew something about CRASH. There was an increase of from 5% to 9% in those

who were deterred from DWI for fear of arrest. A statistical profile of the DWI is given. DWI arrests increased 99% in the test area and 73% in the comparison area, the latter due to use of intoximeters. Enforcement has been vastly improved by the use of the gas chromatograph intoximeters, a revised processing form, and statewide trooper training. There was a substantial reduction in the blood alcohol concentrations (BAC's) of those arrested for DWI 1970-1973. DWI legislation designed and promoted by CRASH was enacted by the Vermont Legislature in May 1973. Since disbanding of the special enforcement team, there has been a surprisingly rapid rate of decline in DWI arrests, suggesting that although the team had accounted for only a very small proportion of such arrests, they had a catalytic, competitive influence on regular patrols. Attached are the following: officer's manual on the use, abuse, and detection of alcohol; trooper knowledge, attitude, and behavior study; study on determining strategies and expectations regarding increased enforcement against alcohol-impaired driving in rural areas; use of videotape recording in DWI enforcement; use of audiotape recording in DWI enforcement; and roadside survey analysis.

Vermont Alcohol Safety Action Proj. CRASH
Contract FH-11-7543
Rept. No. Key-Analytic-Study-3; 1975; 31p
Availability: Reference copy only

HS-802 790

A COMPARATIVE STUDY OF THE EFFECT OF THE VERMONT ALCOHOL SAFETY ACTION PROJECT (PROJECT CRASH)

The impact of participation in Vermont's Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) on critical driving behavior variables, personality, and other behavioral variables was studied by comparing a sample of 333 persons convicted of driving while intoxicated (DWI) attending a CRASH school and with a comparison group of 172 persons from the general population. All subjects' records of DWI arrests, motor vehicle violations, and automotive accidents were obtained for one year prior to initial testing and one year subsequent. Personality and other behavior variables were examined via questionnaires administered at the initial testing point and six and twelve months later. Multivariate analyses of variance were used to analyze the data. Involvement in the CRASH schools does appear to reduce incidents of DWI, automotive accidents, and motor vehicle violations. It also appears to reduce the amount of abusive drinking behavior. Although several artifacts may have contributed to the findings of the six-month follow-up study, it is difficult to cast doubt on the findings of the twelve-month study. Multivariate analyses overcome many of the problems of using contingency table analyses and first order correlations. Further work should include replication of the study and research to define the cause of the impact noted. Appended is a guide for collection of questionnaires from persons convicted of driving while intoxicated.

by Richard E. Boyatzis
Project CRASH, Vermont [Dept. of Mental Health],
Waterbury, Vt. 05676; McBer and Co., Substance Abuse
Programs, 137 Newbury St., Boston, Mass. 02116
Contract FH-11-7543
Rept. No. Key-Analytic-Study-6-1975; 1975; 84p 5refs
Subcontracted to McBer and Co.
Availability: Reference copy only

THE VERMONT PUBLIC EDUCATION CAMPAIGN IN ALCOHOL AND HIGHWAY SAFETY: A FINAL REVIEW AND EVALUATION

The mass media campaign of the Proj. CRASH (Countermeasures Related to Alcohol and Safety on the Highways) functioned from Jun 1972 to May 1974 and was evaluated by comparing results of a precampaign survey in May 1972, a midcampaign survey in May 1973, and a postcampaign survey in May 1974. The campaign had been directed specifically toward the younger driver. The surveys gathered data from interviews of 15 young males (under 30 years of age) and 15 older males from each of 18 roadside sites; information included demographic information, drinking patterns and blood alcohol concentration (BAC) determinations, sources of messages received concerning alcohol and highway safety, knowledge concerning the effects of alcohol, knowledge concerning problem drinking, and opinion regarding alcohol and highway safety. High-risk drivers were considered to be those who consume three to four drinks per sitting at least once a week. Drinking patterns had not changed appreciably since 1971; more of the high-risk young male drivers were noted to have entered higher occupational levels; and there was a substantial increase in the number of Proj. CRASH messages recalled in the second year of the campaign. There was a substantial increase in the knowledge of the Vermont legal limit between 1972 and 1974, but this change was common to both campaign and comparison areas alike. Increases in knowledge of ways to avoid driving while intoxicated appeared to be attributable to the mass media campaign. Young males showed a significant increase in knowledge of such factors as the relative alcohol content of beer and wine, the necessity of waiting to sober up, and the given that a person should have no more than three drinks before driving. As for attitudes, more young males identified fear of losing driver's licenses as the main motivation for not drinking, and more showed support for public education as a safety measure. The percentage of high risk respondents driving with impairing BAC's declined slightly in the campaign-plus-countermeasure area, increased somewhat in the comparison area, but decreased significantly from 21% to 7% in the campaign-only area. The fuel shortage and its effects probably obscured a first-year shift toward reduced alcohol-related fatal crashes. Young males seemed to have been responding to interpersonal communications and to mass communications. Proj. CRASH was more effective without associated countermeasures in influencing knowledge, attitudes, and behavior in the desired direction. The campaign became more effective over time. Any future campaigns should be designed for a predetermined audience, should feature simple messages repeated over an extended period of time, and should combine mass media efforts with interpersonal communications. The campaign materials are appended.

by John K. Worden; Julian A. Waller; Thomas J. Riley
Project CRASH, Vermont Dept. of Mental Health,
Montpelier, Vt.
Contract FH-11-7543
Rept. No. CRASH-I-5; Key-Analytic-Study-7; 1975; 146p
9refs
Availability: Reference copy only

AN ANALYSIS OF PERFORMANCE MEASURES TO DETERMINE TOTAL PROJECT IMPACT [LINCOLN, NEBRASKA ALCOHOL SAFETY ACTION PROJECT]

The impact of the first operational year, 1972, of the Lincoln, Nebr., Alcohol Safety Action Proj. is studied by comparing data with those of 1971, the baseline year. There was a 104% increase in arrests for driving while intoxicated (DWI). There was excellent cooperation between ASAP and the Lincoln Police Dept.; training of personnel increased. There were 553 presentence investigations performed; 365 entered probation. Probation activities emphasized control of drinking. Diagnostic instruments such as the Mortimer-Filkens and the Western Personality Inventory were validated. The Intake and Referral Center established a monthly follow-through monitoring system and made contacts with all relevant community agencies to establish a referral network. An "A.Q." Machine was developed as a display for large gatherings of people. Other activities included a house organ, radio show, and briefing packets. A law was passed which corrected deficiencies in the presumptive limit law. Fatal crashes and fatalities were reduced in the ASAP area, whereas they increased in other areas of the state. The majority of drivers arrested for DWI were shown to have a history of alcohol-related traffic arrests. The lowering of the drinking age from 20 to 19 years in Jul 1972 appears to have been responsible for a doubling of alcohol-related arrests of 19 year olds. There was a shift in average BAC's of those arrested for DWI from .216 to .166 for the special enforcement squad and .182 for the regular police patrols. Household surveys showed an increase in those feeling a likelihood of arrest if DWI of from 24.8% to 35.4%. Roadside surveys showed a decreasing number of drivers with BAC's of .10 or more. However, more people had been drinking: from 24.6% to 20.9%. The Intake and Referral Center handled 557 clients, and began 14 counseling groups for a total of 111 clients. In addition, disulfiram therapy was provided for 250 clients.

by Donald R. Nugent; Frances H. Shocket; Melodie Mayberry; Margaret Pearson; Kay Hewitt
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic-Study-1-1973; 1973; 171p 8refs
Availability: Reference copy only

HS-802 806

AN ANALYSIS OF FATAL CRASHES AND BLOOD ALCOHOL CONCENTRATIONS OF DRIVERS INVOLVED IN FATAL CRASHES [LINCOLN, NEBRASKA ALCOHOL SAFETY ACTION PROJECT]

During the first operational year (1972) of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP), fatal crashes and fatalities were reduced from those of the baseline year (1971) but blood alcohol concentrations of the fatalities increased. There were 12 fatal crashes in 1971 and 9 in 1972; there were 12 fatalities in 1971 and 11 in 1972. The average BAC of the fatalities increased substantially from .02 in 1971 to .132 in 1972; 25% more fatalities were tested for BAC's and there was a decrease of 25% in those having a BAC below 0.15%. The increased BAC's may be explained by the increased efforts to detect alcohol in the blood of fatally injured drivers. It is encouraging that fatal crashes and fatalities within the ASAP area decreased even though they increased in nonASAP areas

of the state. Appended are a statement on the effects of alcohol, sample accident and body fluid report forms, and a copy of proposed legislation requiring quantitative tests for alcohol in fatal accidents in Lincoln.

by Melodie Mayberry
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic-Study-2-1973; 1973; 93p 12refs
Availability: Reference copy only

HS-802 807

AN ANALYSIS OF ASAP PATROL ACTIVITY [LINCOLN, NEBRASKA ALCOHOL SAFETY ACTION PROJECT]

During the first operational year (1972) of the Lincoln, Nebr., Alcohol Safety Action Proj., a six-person special enforcement team concentrated its efforts on weekend late nights. All members of the group were trained in use of the gas chromatograph and in alcohol and highway safety in general. There was a 104% increase in rate of arrest for driving while intoxicated (DWI); 37% of the total arrests were made by the special enforcement group, which used specially purchased cruisers. Public awareness of the squad increased during the year. Stationary radar was tried but abandoned. A map was maintained which showed patterns of drunk driving in the enforcement area. There was some difficulty in detecting DWI's during the afternoon and early evening hours. Officers had to spend more time waiting for case determination than was projected. Waiting for wreckers to tow away the vehicles of DWI suspects also wasted time. The cruisers continued to require maintenance. Divisions between the special enforcement group and the regular police force were overcome. Appended are various report forms and the pertinent statutes.

by Frances H. Shocket; Richard L. Jochem
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic-Study-3-1973; 1973; 106p 7refs
Availability: Reference copy only

HS-802 808

AN ANALYSIS OF THE JUDICIAL DISPOSITIONS OF ALCOHOL RELATED TRAFFIC ARRESTS [LINCOLN, NEBRASKA ALCOHOL SAFETY ACTION PROJECT]

During the first operational year (1972) of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP), there was an 83.5% conviction rate of those arrested for driving while intoxicated (DWI). In comparison with the baseline year of 1971, this was a decrease from 89.7%. There was an encouraging increase of 13.3% in rate of referrals to presentence investigations. There was a slight decrease in the proportion of persons placed on probation, however. Of the probationers in 1972, 63% could be classified as problem drinkers, compared with 93.8% in 1971. A demographic profile of the typical DWI includes the following descriptors: history of arrests and social problems related to alcohol; marital problems; and male, between 20 and 60 years of age.

by Melodie I. Mayberry; Walt Giles
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic Study-4-1973; 1973; 192p 13refs
Availability: Reference copy only

HS-802 810

RATIONALE FOR EVALUATIVE RESEARCH

Research and in particular evaluation research can serve such useful purposes in action projects as steering the planning away from areas already studied or ideas already tried and failed, pointing up conflicts between parts of the system, lessening misunderstanding of goals when evaluation is finally made, and providing ongoing feedback on the system. The researcher should be open about her work with others involved in the action project, even at the risk of losing her detachment. There should be special studies of each type of Alcohol Safety Action Proj. (ASAP) countermeasure; they should combine quantitative and qualitative criteria. Such studies would have impact both on the national and local levels. Natural control groups, interrupted time series designs, and correlational designs can be used as substitutes for experimental control groups. Longitudinal studies should be undertaken. Small positive effects of a program should not be discounted. Efforts should be made to avoid the feeling among program staff that evaluation research is personally threatening. There should be both insiders and outsiders involved in evaluation.

by Heather Hofstetter
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
1973; 25p 46refs
Availability: Reference copy only

HS-802 811

LINCOLN ALCOHOL SAFETY ACTION PROJECT. ROADSIDE SURVEY REPORT 1971-1972

The first two of a series of four roadside surveys were conducted during Nov and Dec of 1971 and 1972 to measure the effects of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) on drinking and driving patterns. Demographic characteristics were determined by interviews and breath samples were taken. The surveys were conducted between 7 P.M. and 3 A.M., Wednesday through Saturday nights, at sites randomly selected within the limits of high traffic density, high accident rate, and not close to bars and taverns. There was a small increase in the number of those with a measurable blood alcohol concentration (BAC), with 3% over the legal limit (.10%) in 1971 and 2% in 1972. The percentages of those driving over 20,000 miles annually decreased, and of those driving less, increased. Wine increased in popularity; other measures of drinking behavior remained fairly constant. The percentage of those who knew the legal definition of being drunk in Nebraska increased from 25.4% and 41.2%. There was a slight increase in the number of those who had heard of a campaign to reduce alcohol-related traffic fatalities: from 60.2% to 68.4%. The newspaper was the primary source of information for those who had heard of the campaign (17.9% in 1971, 31.8% in 1972). There was no change in the percentage of those able to specify ASAP as the sponsoring agency.

by Margaret V. Pearson; Kent Miller
Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room 812, Lincoln, Nebr.
Contract DOT-HS-044-1-060
1973; 59p
Surveys conducted by Mid-America Res. Inc., Lincoln, Nebr. (1971); Univ. of Nebraska, Bureau of Sociological Res., Lincoln, Nebr. (1972).
Availability: Reference copy only

**LINCOLN ALCOHOL SAFETY ACTION PROJECT.
ROADSIDE SURVEY, 1971 - 1972 - 1973.
PRELIMINARY REPORT**

Three of a series of four roadside, public opinion surveys were made in the operational area of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) to measure the project's effects via measurement of drinking/driving patterns. In addition, the surveys attempted to isolate high-risk populations. The surveys included interviews and breath testing of drivers who were for the most part white male residents of Lincoln. ASAP seems not to have had a significant impact on the drinking/driving behavior of Lincoln motorists, since blood alcohol levels were generally consistent over the three years of the survey. There does, however, appear to be an increasing public awareness of drinking and driving behavior as illustrated by the increase in those who knew Nebraska's legal limit and the meaning of blood alcohol concentrations. There was no increase in knowledge of a campaign to reduce alcohol-related deaths in Lincoln shown in the 1973 survey, although there was an increase in those able to identify ASAP as the agency sponsoring this campaign.

by Margaret V. Pearson
Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room
812, Lincoln, Nebr.
Contract DOT-HS-044-1-060
1973; 9p
Availability: Reference copy only

HS-802 813

**AN ANALYSIS OF ULTIMATE PERFORMANCE
MEASURES TO DETERMINE TOTAL PROJECT
IMPACT [LINCOLN, NEBRASKA ALCOHOL SAFETY
ACTION PROJECT]**

The Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) began operations in 1972 and continued for three years. The trend in total crashes was reversed: whereas crashes were increasing by 1.59 per month for the baseline period of 1969-1971, they decreased by 1.25 per month during the operational period. Although there was no significant trend in fatal crashes, there was in injury crashes; fatal crashes are increasing at a slower rate. While the level of total crashes increased significantly over the six-year period, alcohol-related crashes have been slowly declining. There was a significant reduction in injury and property damage crashes. There was a significant increase in total nighttime crashes and a significant decrease in nighttime injury crashes, which are usually alcohol-related. The percentage of fatally injured drivers who had been drinking during the baseline period was 41.7%, compared with 64.3% during the operational period. There was a significant shift to lower blood alcohol concentrations (BAC's) of those arrested for alcohol-related offenses during the operational period. There was a statistically significant increase in the proportion of respondents in the household surveys who were aware of a program or campaign to reduce alcohol-related traffic deaths between 1971 and 1974. However, the roadside surveys yielded the opposite finding. There was a statistically significant shift in perception of risk of apprehension for drunk driving. A cost/benefit analysis based on al-

cohol-related crashes resulted in a calculated loss of savings of about 28 cents per dollar spent.

by Melodie I. Mayberry
Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
Contract DOT-HS-044-01-060
1974; 247p 7refs
Rept. for 1 Jan 1969-31 Dec 1974.
Availability: Reference copy only

HS-802 814

**AN ANALYSIS OF ULTIMATE PERFORMANCE
MEASURES TO DETERMINE TOTAL PROJECT
IMPACT**

Trends in drinking and driving behavior in Lincoln, Nebr., before and after the introduction of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) are studied via fatal accident and alcohol-related fatal accident data. Although daytime fatal crashes increased between 1969 and 1971 and between 1972 and 1973, nighttime fatal crashes decreased. Alcohol-related fatal crashes showed the same trends. Alcohol-related fatal crashes at weekends and in the early morning (12 P.M. to 4 A.M.) were also less, on average, during ASAP's lifetime than they had been in the preceding three years. The extent of other injuries sustained and the amount of property damage incurred also were less in 1972 and 1973 than in 1969-1971. A profile of those who were killed indicates a high proportion of young male drivers and motorcyclists. This age group of 24 years and under is also particularly susceptible to arrests for driving while intoxicated; as a group, and especially those under age 20, they are the least well informed. Household and roadside survey respondents appeared to be somewhat more knowledgeable about ASAP activities since the project's inception, but there were no statistically significant changes in drinking and driving behavior measured in the surveys. It may be due to the fact that the drinking/driving problem, as measured by nighttime fatal crash data, is less severe in Lincoln than it is at some other ASAP sites.

by Heather Hofstetter
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-1-1974; 1974; 73p 18refs
Availability: Reference copy only

HS-802 815

**AN ANALYSIS OF ASAP [ALCOHOL SAFETY
ACTION PROJECT] PATROL ACTIVITY**

The Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) law enforcement activities included increased patrols at times and places at which the likelihood of detecting drunk drivers was greatest. The arrest rate consequently increased 259% between 1971 and 1973. Regular officers approximately doubled their arrests between 1972 and 1973; their arrests represented 71% of all 1973 arrests. The proportion of nighttime arrests increased; two thirds of ASAP arrests occurred during the time period 12 P.M. to 4 A.M. Percentage of weekend arrests increased from 54% in 1971 to 64% in 1973; ASAP officers made 62% of their arrests on weekends. The percentage of arrests for driving while intoxicated (DWI) which involved an accident was reduced from 41.5% in 1971 to 18.5% in 1973; in absolute numbers, however, DWI arrests involving an accident have increased, especially those occurring at nighttime. Ar-

rests tend to be clustered in the central district and on Cornhusker Hwy. in the northern part of Lincoln. Although two thirds of the 1973 ASAP arrests occurred in those parts of the city, alcohol-involved accidents were not so concentrated. Cost of an ASAP arrest (based on patrol manhours only) was \$60.47 in 1973, \$7 less than in 1972. Average cost of processing an arrest was \$22.32 in 1972 and \$17.20 in 1973. Of all warnings and tickets issued by ASAP officers, 8.2% were for DWI, 11.5% were for hazardous moving violations, and 65.3% were warning tickets. Lincoln spent a lower percentage of total budget on law enforcement and had the lowest number of arrests per ASAP officer in 1972, compared with other ASAP areas of similar size which became operational in that year. Of those arrested for DWI, 90% or more were males. The number of women arrested has risen, however, from 24 in 1971 to 146 in 1973. Young drivers are overrepresented in DWI statistics compared to their proportion of the licensed driver population. The preliminary screening device, used between Apr and Aug 1973, helped the regular officers increase their arrests and decrease arrests of those who would later be released. Police enforcement was considered to be effective by 85.6% of the respondents in the 1971 household survey and by 84.1% in the 1972 survey.

by Heather Hofstetter
Lincoln Safety Alcohol Action Proj., 812 Lincoln Bldg.,
Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-3-1974?; 1974?; 86p 18refs
Availability: Reference copy only

HS-802 816

AN ANALYSIS OF THE IMPACT OF ASAP ON THE TRAFFIC SAFETY SYSTEM [LINCOLN, NEBRASKA ALCOHOL SAFETY ACTION PROJECT]

A sample of 100 arrests in each year for 1971, 1972, and 1973 was studied to determine the influence of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) which was operational in the latter two years of the sample. Percentages of arrests resulting in convictions for either the initial charge or a lesser charge were 90%, 96%, and 93% respectively. Percentages of arrests which were granted presentence investigations were 41%, 64%, and 49% respectively. Percentages of those who were offered and accepted probation were 31%, 44%, and 27% respectively. Percentages of problem drinkers put on probation were 70.7% for 1972 and 50% for 1973; percentages of non problem drinkers put on probation were 64.9% and 70% respectively. Percentages of those who received no treatment were 98%, 52%, and 68% respectively. Percentages of those involved in more than two types of treatment modalities were zero, 22%, and 23% respectively. Rates of recidivism were 6%, 5%, and 14% respectively. There was no significant difference in the distribution of blood alcohol concentrations (BAC's) for cases receiving straight sentences versus those receiving probation for all three years. In the latter two years, probationers tended to have better driving records than those receiving straight sentences. Average number of days from arrest to arraignment and case finding were 40.1, 42.1, and 53.5 respectively. The total processing time of cases from arrest to sanctioning has continually increased during the first two

operational years of the ASAP. Percentages of use of pretrial procedures was 78%, 82%, and 91% in 1973.

by Melodie I. Mayberry
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic-Study-4-1974; 1974; 182p 9refs
Availability: Reference copy only

HS-802 817

AN ANALYSIS OF DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

The Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) activities during 1972 and 1973 included diagnosis of the individual's drinking problem and appropriate referral to rehabilitation and treatment. Of the 560 persons for whom presentence investigations were made in 1972, 63% were classified as problem drinkers, compared to 70% of the 636 in 1973. The most frequent combination of treatments to which probationers were assigned in 1973 was that of court classes, Alcoholics Anonymous, chemotherapy, and individual and group counseling. Of those assigned, 93% were problem drinkers. This combination also had the lowest dropout rate of all referral combinations. The recidivism rate for problem drinkers on probation was significantly lower than that of problem drinkers not placed on probation. There was no statistically significant difference in recidivism rates between nonproblem drinkers placed on probation and those denied probation. Clients receiving presentence investigations were predominantly white males and blue collar workers; single and divorced persons were overrepresented and married persons were underrepresented. More problem drinkers than nonproblem drinkers were divorced or separated. Almost half the clients age 20 years or younger were problem drinkers, and 60% of those age 21 to 25 years were problem drinkers. Problem drinkers had a significantly higher record of previous alcohol-related driving offenses than did nonproblem drinkers. Clients placed on probation were likely to be nonproblem drinkers with two or less previous alcohol-related driving offenses and alcohol-related nonvehicular offenses.

by Margaret V. Pearson
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-5-1974; 1974; 85p
Availability: Reference copy only

HS-802 818

AN ANALYSIS OF ALCOHOL REHABILITATION EFFORTS

The rehabilitation activities of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) included court classes, Alcoholics Anonymous, disulfiram therapy, inpatient treatment, and group and individual counseling. Recidivism rates for probationers were significantly lower than for nonprobationers. Recidivism of those participating only in the court class was the highest of the top 15 combinations of treatments. The number of recidivists involved, however, was too low for conclusions to be drawn on the relationship of treatment modalities and recidivism rates. The age group 26 to 30 years was overrepresented among recidivists; single people, students, and lower income clients were underrepresented. Profiles of those who dropped out of probation tended to include insta-

been successful.

by Margaret V. Pearson
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-6-1974; 1974; 77p
Availability: Reference copy only

HS-802 819

PUBLIC INFORMATION AND EDUCATION, LICENSING AND REGISTRATION, LEGISLATION AND REGULATORY

Some of the activities of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) during 1973 were public information activities, a driver license review system, and liaison with the Nebraska legislature. Public affairs work included revision and mailing of a brochure, revision of the slide show, and increased distribution of the newsletter. The radio program was cancelled. Six press releases were made. The public information campaign involved the use of the "A.Q." machine seven times, use of media spots, and work with the Lancaster County Beverage Assoc. to produce a packet of printed information. Contact with youth included one meeting, design of a breathalyzer demonstration, and development of an instructional packet for distribution to public school libraries. Information on the drunk driver was mailed to physicians, a speaker's bureau flyer was mailed to program chairmen of civic organizations, and educational materials were sent to the Lancaster County Legislative delegation and to the State Dept. of Motor Vehicles' Health Advisory Board. The Dept. of Transportation curriculum, "Alcohol and Alcohol Safety," was adopted for use in 300 accredited driver education programs, and workshops on its use were conducted. An information seminar on alcohol and traffic safety was conducted for the six communities participating in the Nebraska ASAP, as well as three five-day institutes. Help was given in the production of "A.Q." machines for the Kansas City, Mo., ASAP and for the Hennepin County ASAP. Some time was spent in developing the Driver Licensing Review System. No recommended legislative change was enacted, but two nonrecommended changes were. A household survey showed a steady increase in the percentage of respondents who correctly identified the presumptive limit.

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Annual-Report-1974-2-B; 1974; 58p
Availability: Reference copy only

HS-802 820

AN ANALYSIS OF ULTIMATE PERFORMANCE MEASURES TO DETERMINE TOTAL PROJECT IMPACT

Impact of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) was measured by observing changes in level, slope, and distribution of fatal, injury, and property damage crashes, and alcohol-related fatal, injury and property damage crashes as a total group and separately. The increase in crashes over the baseline period (1969-1971) and during 1972-1973 appears to be highly correlated to the accompanying increase in miles driven annually and the increased number of licensed drivers. While total crashes have increased significantly over the five-

year period, without, however, any indication that the change in level is associated with ASAP activities. Alcohol-related fatal crashes have been declining but without statistical significance. In the household and roadside surveys more respondents were aware of the ASAP campaign. In the respondents' risk perception of the chances of certain events happening to them if they were to drive after drinking excessively, the differences between 1971 and 1973 were statistically significant. A significantly larger proportion of drivers is being arrested at lower blood alcohol concentrations (BAC's) since inception of ASAP. No significant changes were detected in the BAC distributions of drivers tested in the roadside surveys for 1971, 1972, and 1973. A cost-benefit analysis on alcohol-related crashes only and rehabilitated clients resulted in a calculated savings of approximately \$1,112,000 or a cost-benefit ratio of .89; the return on every dollar spent was \$1.12.

by Melodie I. Mayberry
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-1-1973-Supp; Analytic-Study-3-1973-Supp; 1974; 140p 4refs
Availability: Reference copy only

HS-802 821

LINCOLN ALCOHOL SAFETY ACTION PROJECT. HOUSEHOLD SURVEYS 1971, 1972 AND 1973

The third in a series of household surveys was conducted to measure overall project impact and impact of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) public information and education campaign. Personal interviews were held with a randomly selected sample of 505 of the adult residents of Lincoln. A series of tables are presented with frequent comparison of percentages among the three years. The survey included questions about drinking, driving, and drinking and driving behavior, about knowledge of alcohol-related subjects, and about knowledge of an perceived effectiveness of LASAP activities. There was a greater awareness in 1973 of the relationship between alcohol consumption and accident involvement and of police efforts to cut down on drinking and driving, although many people continued to drive when aware that they should not.

by Janet K. Ries
Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room 812, (Lincoln, Nebr.)
Contract DOT-HS-044-1-060
1974; 50p 2refs
Subcontracted to Mid-America Res., Inc. (1971); Univ. of Nebraska, Bureau of Sociological Res., Lincoln, Nebr. (1972-3).
Availability: Reference copy only

HS-802 822

AN ANALYSIS OF ALCOHOL REHABILITATION EFFORTS

The Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) rehabilitation efforts included the following treatment modalities: court classes, Alcoholics Anonymous, disulfiram therapy, inpatient treatment, and group and individual counseling. Among problem drinkers, the percent of recidivists is higher for non-probationers than for those on probation; among nonproblem drinkers, the percent of recidivists among those on probation

the recidivism rate is highest among those assigned to the combination of all five treatment modalities; the second highest recidivism rate occurred among those assigned to court classes only. Divorced persons are slightly overrepresented among recidivists, but those in presumably unstable occupations (part-time, students, unemployed) are not, of those who complete probation as opposed to those who drop out, the ones in unstable marital situations and in blue collar positions are overrepresented among dropouts.

by Janet K. Ries
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-1-060
Rept. No. Analytic-Study-6-1975; 1975; 76p
Rept. for 1 Jan 1972-31 Dec 1974.
Availability: Reference copy only

HS-802 823

AN ANALYSIS OF ASAP [ALCOHOL SAFETY ACTION PROJECT] PATROL ACTIVITY 1972-1974

The law enforcement countermeasure of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP), is studied by examining the cost-effectiveness of squad operations, the time of day, day of week, and location of all arrests for driving while intoxicated (DWI), the profile of drivers arrested for DWI, and the effects of the ASAP patrol on the operation of the Lincoln Police Dept. and other countermeasure activities. Among the major findings presented are the facts that between 1971 and 1974 DWI arrests increased 334%, regular officers nearly tripling their arrests, while the ASAP squad's arrests increased from 346 in 1972 to 471 in 1973 and then decreased to 399 in 1974. Since the baseline period, nighttime arrests increased significantly, the period between midnight and 4:00 A.M. showing the greatest increase in arrests. Though the proportion of DWI arrests has gone down, the absolute numbers have gone up, especially at night. Half the DWI arrests were made in two areas of Lincoln. Males comprised 90% or more of those arrested for DWI in the past four years, but the numbers of women arrested rose from 24 in 1971 to 156 in 1974. From 1971 to 1974, the percentage of DWI arrest with BAC above .15% has been steadily decreasing. The ASAP squad has overall been more efficient at detecting drivers at lower BAC levels than the regular patrol. Respondents in a household survey were increasingly less likely to consider police enforcement a "very effective" or "effective" countermeasure. Man-hours per arrest and costs of ASAP arrests increased from 1973 to 1974; the cost to the Lincoln ASAP of processing a DWI arrest has decreased. Only 3.1% of all patrol contact of ASAP officers involved DWI arrests; hazardous moving violation warnings and tickets for defects, expired registration, etc., constitute 89% of the tickets and warnings issued. A preliminary screening device, tested experimentally in 1973, was used regularly after Aug 1974. This may have increased ASAP officers' street time, but it decreased the amount of time processing DWI's who were later released. The increase in arrests affected other parts of the system, necessitating streamlining of services and addition of personnel.

by Martha L. Perrins
Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
Contract DOT-HS-044-01-060
1975; 103p 13refs
Availability: Reference copy only

LINCOLN ALCOHOL SAFETY ACTION PROJECT. HOUSEHOLD SURVEY REPORT 1971-1974

Four roadside surveys were conducted in the autumn months of 1971, 1972, 1973, and 1974 in Lincoln, Nebr., to evaluate the impact of that city's Alcohol Safety Action Proj. (ASAP) on drivers' drinking behavior. Data gathered included blood alcohol concentrations (BAC's), demographic information, characteristic drinking behavior, and attitudes toward alcohol-related subjects. Comparison of results revealed the following trends. Although there has been no consistent change in the percentage of respondents who had been drinking, the 1974 data show a reduction in the percentage who tested above .05%. Generally, between one fifth and one quarter of the respondents had been drinking for all four years. The percentage of respondents testing over .10% varied between 1.6% and 3%. Examination of BAC by day of week revealed no significant difference in 1974 in the percentage of those driving above .10% and those that had been drinking between weekdays and weekends. Across all four years there has been a substantial difference in the BAC levels between early evening hours (7 P.M. - 11 P.M.) and early morning hours (11 P.M. - 3 A.M.). The time period, 1 A.M. - 3 A.M., showed more respondents that had been drinking than the period from 11 P.M. to 1 A.M. Between 83% and 89% of those surveyed in the four years said they drank alcoholic beverages. In all four years, beer was the most common drink. There has been a significant decline in the percentage of respondents who said that they drank liquor most often. There has been no consistent change in drinker classification over the four years. The great majority of respondents classified themselves as "very light" or "fairly light" drinkers. Respondents are reluctant to classify themselves as "fairly heavy" or "heavy" drinkers no matter how many days a week they report that they drink or how much they report drinking in a day. The percentage of respondents who knew the legal limit has increased significantly from 25% in 1971 to 55% in 1974. Between 77% and 85% of the respondents knew what blood alcohol concentration meant. Of those respondents in 1974 who were aware of a campaign in Lincoln to reduce alcohol-related traffic deaths, 31.5% could identify ASAP as the sponsoring agency. This is a substantial increase over the 6%-7% that were able to in 1971-1973. The newspaper was the primary source of information for those who had heard of a campaign. Awareness of special police activities for the drinking driver has decreased slightly from 43% in 1973 to 41% in 1974. ASAP programs such as probation and court classes were the activities specified more often than others. Most people tend to underestimate the approximate number of drinks it would take them to reach illegal intoxication.

by Martha L. Perrins
Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
Contract DOT-HS-044-1-060
1975; 89p
Availability: Reference copy only

HS-802 825

LINCOLN ALCOHOL SAFETY ACTION PROJECT. HOUSEHOLD SURVEYS 1971-1974

Household surveys, conducted in Oct 1971-1974 as part of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP), were designed to measure the public's self-reported knowledge and attitudes about alcohol and the drinking driver. Between 73%

and 82% of respondents in all four years said that they drink; significantly more are men than women, and a majority considered themselves light or very light drinkers, though there is a tendency to drink on more days of the week in 1974 than in 1971. Most respondents said they drive every day, but rarely after drinking. A larger number in 1974 than in 1971 cited driving while intoxicated as the cause of most accidents, while ascribing most fatal accidents to the large number of social drinkers rather than the smaller number of problem drinkers. In general, they seemed more knowledgeable in 1974 than in 1971 about myths concerning alcohol, about the blood alcohol level, and about the campaign to reduce alcohol-related traffic deaths.

by Martha Perrins; Janet K. Ries
Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room 812, Lincoln, Nebr.
Contract DOT-HS-044-1-060
1975; 87p 2refs
Subcontracted to Mid-America Res., Inc. (1971); Univ. of Nebraska, Bureau of Sociological Res., Lincoln, Nebr. (1972-3); Edutek, Inc. (1974).
Availability: Reference copy only

HS-802 826

AN ANALYSIS OF THE IMPACT OF ASAP ON THE TRAFFIC SAFETY SYSTEM

A sample of 400 arrestees, 100 for each of the years 1971-1974, was tracked through the law enforcement, judicial, and rehabilitation components of the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) to determine the effectiveness of the project. Conviction rates, referral rates, and distribution of case disposition over the four years were studied to determine trends. Conviction rates (initial or lesser charge) were 91%, 96%, 92%, and 95% respectively. Rates of presentence investigations requested were 41%, 64%, 49%, and 53% respectively. Rates of probation offered and accepted were 31%, 44%, 27%, and 25% respectively. The likelihood of receiving a presentence investigation was greater during the operational years of ASAP than during the baseline year. The chances of probation declined from 1971 to 1974. The percentages of problem drinkers placed on probation were 70.7% in 1972, 50% in 1973, and 47.2% in 1974; chances of probation for non-problem drinkers in those years were 64.9%, 70%, and 70% respectively. Percentages of those participating in some kind of treatment were 2%, 47%, 32%, and 43% respectively. Percentages of those involved in more than two types of treatment modalities were zero, 22%, 23%, and 22% respectively. Recidivism rates were 6%, 5%, 14%, and 8% respectively. There was no significant difference in the distribution of blood alcohol concentrations (BAC's) for cases receiving straight sentences versus those receiving probation for all three years; neither were there any differences found for cases convicted of DWI and lesser charges. Probationers in 1971 tended to have longer driving records than nonprobationers, but this disappeared in 1972, and was reversed in 1973. Number of days between arraignment and case finding were 40.1, 42.1, 53.5, and 79.3 respectively. Increased backlog of court cases was the cause of the delay and may have had an effect on the recidivism rates between 1972 and 1974. Processing time for recidivists rose from 49.5 days in 1971 to 113.8 days in 1974.

Rates of pretrial disposition of cases were 78%, 82%, 91%, and 83% respectively.

by Melodie I. Mayberry
Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
Contract DOT-HS-044-1-060
1975; 237p 9refs
Rept. for 1 Jan 1971-31 Dec 1974.
Availability: Reference copy only

HS-802 827

AN ANALYSIS OF DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

Diagnosis and referral procedures used within the Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) rehabilitation activities during the project's operational period from 1972 through 1974 included the presentence investigation process and probation. Of the approximately 2000 court referrals who went to the Intake and Referral Center, 69% were classified as problem drinkers. The most frequent combination of treatments to which probationers were assigned was the combination of court classes, Alcoholics Anonymous, chemotherapy, and individual and group counseling. Most of the people assigned to this combination were classified as problem drinkers; the drop-out rate for this combination was relatively high. The second most frequent assigned combination of treatments was court classes and group counseling; most of these clients were classified as nonproblem drinkers and the dropout rate was the lowest of the treatment combinations discussed. The difference in percent of problem drinkers assigned to these specific combinations suggests that this factor needs to be considered when assessing treatment effectiveness. The recidivism rates of probationers were generally lower than those of nonprobationers, with problem and nonproblem drinkers alike. Males and whites predominated among the presentence investigation (PSI) clients; single, divorced, or separated persons were overrepresented, but among single persons most were nonproblem drinkers. The percent of problem drinkers in each age grouping increased directly with age. Comparison of PSI clients who received probation and those who did not indicates that probation is most likely to be granted to non-problem drinkers; thus, those who may be in most need of probation are likely to be denied it.

by Janet K. Ries
Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
Contract DOT-HS-044-01-060
Rept. No. Analytic-Study-5-1975; 1975; 63p 10refs
Availability: Reference copy only

HS-802 828

LASAP TELEPHONE SURVEY: A STUDY IN THE EFFECTIVENESS OF A PUBLIC INFORMATION LIQUOR CAMPAIGN ON ALCOHOL AND HIGHWAY SAFETY

The impact of the joint Lincoln, Nebr., Alcohol Safety Action Proj. (ASAP) public information and education/Lancaster County Beverage Association's "KNOW YOUR LIMIT" campaign in on-sale and off-sale establishments, conducted during the summer of 1974, was measured by telephone interviews both pre-tests and post-tests. There was a statistically significant difference between respondents of the pre-tests and post-tests on the variable dealing with the identification of the

Nebraska legal limit; apparently no variable for this campaign was effective. The dominant element in the campaign seemed to be the "Know Your Limit" cards, distributed in local drinking establishments in conjunction with other information and displays. While the drinking and driving habits of the respondents were not related to their recall of the campaign contents, at least the drinking driver is more likely to be exposed to such a campaign by greater attendance at drinking establishments.

by Melodie I. Mayberry
Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
Contract DOT-HS-044-01-060
1975; 40p
Availability: Reference copy only

HS-802 831

AUTOMATIC TREAD GAGING MACHINE

An Automatic Tread Gaging Machine (ATGM) has been developed, consisting of three component systems: a laser gaging head, a tire handling device, and a computer which controls the movement of the tire handling machine and which also processes the data and computes the least squares straight line from which a wear rate may be estimated. The ATGM measures the groove depths relative to adjacent ribs and computes the tire average groove depth each time the tire is measured. Data are stored until the test is complete, at which time the least squares straight line for average groove depth versus miles run is computed. The rate of wear and the average original groove depth is calculated from the slope and intercept of the regression curve. Measurements are made by moving the tire laterally in front of the laser beam so that the tire is scanned from shoulder to shoulder. The tire is then rotated 60° and the process is repeated. The computer controls the motions of the tire, and collects and processes the data to obtain the groove depths. Data are averaged and retained for later processing to obtain a wear rate equation. Experimental tests show that the machine has good repeatability. In various comparisons with measurements obtained by a hand gage, the ATGM gives smaller average groove depths than the hand gage. The differences before and after a period of wear for both modes of measurement are the same. Wear rate estimated from the slopes of straight lines fitted to both sets of data are not significantly different. Appended is a description of the computer programs controlling the ATGM.

by Glenn S. Ludwig; F. Cecil Brenner; C. Conley
National Hwy. Traffic Safety Administration, Safety Res.
Lab., 6501 Lafayette Ave./Bldg. 2, Riverdale, Md. 20840
Rept. No. T-1031; 1977; 124p
Availability: NTIS

HS-802 832

RESEARCH SAFETY VEHICLE (RSV). PHASE 3. STATUS REPORT NO. 5, 1 SEPTEMBER-31 OCTOBER 1977

The structural design of the Res. Safety Vehicle (RSV) is nearing completion; development of the restraint system has been completed, except for a few details, and the installation drawings of the engine with the manual transmission is finished. The antiskid brake system design has been completed and installed; test data from the mule car show that the suspension performs as designed. The fuel tank and fuel

system design are completed and except for some interior components, the styling activity is finished. Static Crush Vehicles 1 and 2 have been fabricated and tests completed on No. 1 to determine load/deflection characteristics in the fore and aft direction. Design validation tests have been initiated on the restraint system and acceptable 40 mph performance of the rear seat system for 50th percentile male anthropometric test devices demonstrated. Cooling tests on the mule car indicate satisfactory performance of the manual transmission RSV, though there may be a problem with the automatic transmission and air conditioning. Braking tests show satisfactory performance with the front and rear diagonal split with a partial system failure. Tests on the mule car indicate that if a .405 drag coefficient can be realized, a combined fuel economy of 30 mph is achievable. Additionally, an overall plan has been compiled for the integrated systems dynamic tests to be initiated during the next reporting period. Presentation of extensive data in tabular form is accompanied by photographs and diagrams.

Calspan Corp., Buffalo, N.Y. 14221
Contract DOT-HS-7-01551
Rept. No. PR-5; 1977; 223p 6refs
Proj. ZN-6069-V-5.
Availability: Reference copy only

HS-802 850

AN ANALYSIS OF BAL [BLOOD ALCOHOL LEVEL] DATA FOR DRIVERS FATALLY INJURED

Analysis was made of blood alcohol level (BAL) data for drivers fatally injured in Phoenix, Ariz., during the year 1972. Of the 101 accident fatalities, 58 were drivers: BAL data were obtained on 46 of these drivers, and positive BAL readings (0.01% BAL or higher) were recorded for 30 of the 46. Relative to the 58 drivers killed, therefore, there is positive evidence that 52% had been drinking. Some of the others were victims of other drivers who had been drinking. Average BAL's for drivers fatally injured during 1972 were highest between 8:00 P.M. and midnight (0.171%) and between midnight and 4:00 A.M. (0.170%). These levels are over three times the average BAL's for any other four-hour time block during the 24-hour day. The highest average BAL's occurred on Saturday (0.152%) and Sunday (0.170%). The critical age levels for the fatally injured drinking drivers were 20-34 years of age (0.137% BAL), 45-54 (0.115% BAL), and 55-64 (0.135% BAL). Of the 46 drivers killed during 1972 for which BAL data were obtained, 38 of the victims were male with a 0.139% average BAL and eight were female with a 0.071% average BAL. Of the 58 fatally injured drivers, nine were driving motorcycles.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-2-1972; 1973; 15p
Subcontracted to Arizona State Univ.
Availability: Reference copy only

AN ANALYSIS OF THE JUDICIAL DISPOSITION OF ALCOHOL RELATED TRAFFIC ARRESTS

The judicial disposition of alcohol-related (A/R) traffic arrests in Phoenix, Ariz., during the year 1972 were analyzed. During that year, the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) was in operation Feb-Dec. The arraignment data indicate that the trend which increasingly developed throughout the year was to plead innocent and to request a jury trial. An average of 32.14% of the DWI (driving while intoxicated) cases tried during the year were ASAP, and 67.86% were non-ASAP. Of the total number of DWI arrests, an average of 22.91% were ASAP, and 77.09% were non-ASAP. In spite of the fact that almost 10% more ASAP cases arrested went to trial, the percent found guilty during trial was 9.42% higher than for the non-ASAP cases. This indicates that the ASAP officers and attorneys were more effective than the non-ASAP personnel. With respect to those found not guilty during trial, there was little difference between the two groups. The data received through the ASAP project reporting system indicates a gradual reduction in convictions during the 11-month ASAP operating period, a gradual increase in non-alcohol-related (A/R) convictions of DWI cases, and a gradual increase in dismissals. These trends are believed to be the result of a combination of the following factors: a large increase in volume of DWI cases (61%) during 1972 (a burden on an already overburdened judicial system); new statutes enacted during the 1972 legislative session, providing for a mandatory jail sentence if convicted for DWI and lowering of the presumptive BAL limit from 0.15 to 0.10; establishment of procedures which required the defendant to be represented by an attorney, unless he/she knowingly and intelligently waived rights for a defense attorney; and a general increase in the awareness of the ASAP project. On the basis of the data examined, it is concluded that the judicial activity of the Phoenix ASAP contributed to the overall project objectives of reducing A/R accidents, injuries, and fatalities. The most pressing problem in the judicial countermeasure continues to be the backlog of DWI cases (a total backlog of over 7000 cases by year end 1972).

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-4-1972; 1973; 63p
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 852

AN ANALYSIS OF PROBLEM DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

Processes for problem drinker diagnosis and referral utilized in the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) are described, and the countermeasure contributions to the ASAP traffic safety program are evaluated. The subject is discussed under the following topics: updated description and flow chart of judicial/rehabilitation system, screening criteria, procedures for diagnosis and decision of drinker classification, procedure for general or specific referral of each problem drinker type, impact of diagnosis and referral activities on the court system and rehabilitation resources of the community, referral activity's effect on recidivism, problem drinker diagnosis and referral costs in time and money, drinker

bilitation countermeasure referrals, and background investigation summary. Appendices contain an illustrative computer printout based on information contained in a given subject's police record and his/her responses to a battery of questions, and an outline of the structure of an alcoholism assessment interview conducted by the Diagnostic Review Board.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Phoenix, Ariz.; Arizona State Univ., Evaluation Res. Team; St. Luke's Hosp. Medical Center, ASAP Diagnostic Review Board, Phoenix, Ariz.
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-5-1972; 1973; 129p Prefs
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 854

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT, 1972

The Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) began operations on 5 Jan 1972. Its overall objectives were to achieve significant reduction in alcohol-related (A/R) crashes resulting in fatalities, injuries, and property damage; and to generate public support and stimulate state and community programs. The Project is comprised of a series of integrated programs: enforcement, judicial, rehabilitation and regulatory, licensing and registration, public information and education, and evaluation and project management. A press conference emphasizing the importance of ASAP was one of the first activities. ASAP enforcement personnel received special training. Equipment purchased included ten motorcycles, one automobile, a gas chromatograph intoximeter, a spectrophotometer, a printing calculator, four breathalyzers, and gas chromatograph intoximeter field encapsulators. ASAP helped finance two new courtrooms and several offices, which were available by Apr 1972. All ASAP systems were functioning as a unit by May. High DWI arrest rates created problems which lasted throughout the year. Innovative programs such as the volunteer probation partner and crisis intervention programs showed signs of being quite helpful to the DWI offender. Court scheduling of DWI cases was a problem. Continuation of sentence served to direct about 5000 individuals into evaluation for further diagnosis and treatment. Hospital programs for problem drinkers were modified, based on ASAP experience. A massive public information and education program stimulated interest and support. There was a 7% reduction in total crashes, and a 13% reduction in alcohol-related crashes, a 192% increase in A/R fatal crashes, a 24% reduction in A/R injury crashes, a 1% reduction in property-damage crashes, and a 200% increase in A/R crash fatalities. Recidivism data analysis suggests that rehabilitation is useful. Tables provide quarterly statistical data on the following: total project impact, total project impact - financial and personnel, fatal single vehicle excluding pedestrian crashes, fatal multivehicle excluding pedestrian crashes, fatal pedestrian crashes, total fatal crashes, single vehicle injury excluding pedestrian crashes, multivehicle injury excluding pedestrian crashes, pedestrian injury crashes, total injury crashes, crash data, BAC (blood alcohol concentration) for drivers killed, BAC data for drivers arrested for A/R offenses, enforcement - financial and personnel, ASAP patrol activity by time of day, regular patrol activity by time of day, judicial-financial data, judicial operations - disposition of A/R traffic arrests, judicial - background investigation activity, rehabilitation - financial and personnel,

record review, and public information and education activity summary.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004
Contract DOT-HS-052-1-058
Rept. No. Annual-Report-1972; Annual-Report-1972-App-H; 1973; 328p
Availability: Reference copy only

HS-802 855

AN ANALYSIS OF ULTIMATE PERFORMANCE MEASURES TO DETERMINE TOTAL PROJECT IMPACT

Impact of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) during 1973 on ultimate performance measures was analyzed. The following performance measures were studied: alcohol-related (A/R) crashes and resulting injuries, fatal injuries, and property damage; cost-effectiveness of the countermeasure program; time of day, day of week, origin, age, occupation and location logistics, blood alcohol level (BAL) distributions both for drivers fatally injured and for all drivers arrested DWI (driving while intoxicated); trends in public awareness of the program and the drinking driver problem; correlations between overall ASAP impact and impacts of the several individual programs; and recidivism following program exposure for those convicted of driving while intoxicated (DWI). A DWI driver profile analysis is included as an appendix. With respect to A/R crashes it was determined that they were significantly reduced relative to projections from former years (total crashes 24% under projection, crashes resulting in fatalities 7% under projection, injury crashes 45% under projection, property-damage-only crashes 8% under projection). It was found that the population of DWI drivers was reduced, as evidenced by fewer A/R crashes, fewer arrests for DWI, lower average BAL for those arrested, and a reduction in DWI recidivism rate in recent quarters. The public in Phoenix was found to have a greater awareness of concern with the drinking-driving problem, as evidenced by the Spring 1973 survey of 700 households in Phoenix compared with the Fall 1971 pre-ASAP survey. Rehabilitation in the forms of education, counseling, and therapy are being provided to those who need help, as evidenced by more problem drinking drivers than non-problem drinking drivers in the counseling and therapy activities. It is shown that more of those DWI who stand trial are being convicted and sentenced; however, the increased enforcement effort on lower BAL drivers, among other changes, has resulted in considerably higher rates of plea bargainings and dismissals in 1973 than in former years. The DWI recidivism rate is gradually being lowered, comparing recent quarters with comparable quarters in 1972. In addition, cost benefits in fatality, injury, and property damage loss reductions exceeded ASAP program costs by nine to one during 1973.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85003; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-1-1973; 1974; 81p 4refs
Subcontracted to Arizona State Univ.
Availability: Reference copy only

AN ANALYSIS OF JUDICIAL OPERATIONS

The judicial operations in the City of Phoenix, Ariz., for driving while intoxicated (DWI) cases are analyzed as they relate to the city's Alcohol Safety Action Proj. (ASAP). The study was based upon a random sample of drivers arrested for DWI during the month of Mar in 1971, 1972, and 1973. The 1971 sample was considered baseline, while the 1972 and 1973 data were based upon ASAP operations and were divided into ASAP and non-ASAP arrested subjects. The sample consisted of a total of 250 subjects as follows: 50 1971 baseline subjects; 50 ASAP subjects for each year 1971 and 1972; and 50 non-ASAP subjects for each of the two operational years of the ASAP (1972 and 1973). The operation of the judicial activities of the ASAP is described, and data are presented on judicial disposition of cases, prior and post arrest activities, BAL (blood alcohol level), and age of all subjects. Reduction in guilty convictions and the increase in dismissals between the baseline year (1971) and the two ASAP operational years (1972-1973), were due, in part, to the large increase in volume of cases over the period, attracting more defense attorneys and somewhat lessening the effectiveness of the prosecution; the lowering of the BAL from 0.15 to 0.10 making it more difficult to obtain convictions and providing a stronger basis for plea bargaining; and the large increases in volume coupled with more defense activity and lower BAL's, resulting in fewer guilty pleas and more court trials, and further overloading the court system. The prior and post arrest records for the samples examined were worse than they were during the baseline year because of the increased probability of being rearrested due to the increased efficiency of enforcement, particularly the ASAP patrol. It was found that the court operations were more effective in reducing the time between arrest and final determination of innocence or guilt of the defendant due to reorganization of the court system and change in procedures. The lower mean BAL levels for those arrested by the ASAP patrol was due to the training provided to the ASAP patrol members and their dedication to their task, both of which resulted in the detection and apprehension of DWI's with lower BAL's.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-4-1973; 1974; 77p 4refs
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 857

AN ANALYSIS OF DRINKER DIAGNOSIS AND REFERRAL ACTIVITY

The processes for Problem Drinker diagnosis and referral utilized in the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) are described, and contributions to the ASAP traffic safety program are evaluated. Separate consideration is given to the overall ASAP activities as well as two major elements of the ASAP, the Diagnostic Review Board under the management of St. Luke's Hospital Medical Center, and the driving while intoxicated (DWI) school. The activities of the Diagnostic Review Board (DRB) in 1973 included modification of the structured interview ratings, further training of the interviewers on assigning ratings, greater standardization of referrals to the rehabilitation program at St. Luke's Hospital Sub-

designed for minority ethnic groups such as the Corazon outpatient driving while intoxicated (DWI) program for Mexican-Americans and the Urban Indian Counseling Center, and the assignment of each client to an individual appointment time with an interviewer. The activities of the Phoenix driving while intoxicated (DWI) school in 1973 included an increase in group counseling, the addition of the Zung Depression Scale to the battery of diagnostic tests, preparation of a slide show which explains ASAP and gives test battery instructions, and development of forms for those who do not read and for those for whom Spanish is the first language. The rating instrument was refined to provide more specific diagnoses, individual counseling was performed both in person and by telephone, and follow-up contacts were made, usually just prior to sentencing of the client.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-5-1973; 1974; 40p 5refs
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 858

AN ANALYSIS OF ALCOHOL REHABILITATION EFFORTS

Alcohol rehabilitation efforts for the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) during the period 1 Jan 1973-30 Jun 1974 are analyzed. Some statistics were developed for the entire period of ASAP's operation, going back to Jan 1972. Extensive material is presented on recidivism analysis for those completing the driving while intoxicated (DWI) School Programs; recidivism analysis for the St. Luke's Rehabilitation Programs associated with St. Luke's Hospital Substance Abuse Center, Phoenix; and measures of effort and cost-effectiveness. The original experimental design for the recidivism analysis was violated relative to the control group; therefore, meaningful statistical analyses were not possible. First-year recidivism following DWI School increased in proportion to the DWI arrests of the subject prior to school exposure. The noncompletion rate for two of the four DWI School Programs, which involved class attendance, averaged better than 25%. Subjects exposed only to three of the DWI School Programs had consistently lower first-year recidivism rates than for the fourth program (a control group which did not receive a school program). However, this finding applies only to those not referred to the Diagnostic Review Board (DRB) at St. Luke's Hospital and St. Luke's treatment modalities (a series of blackboard lectures, individual counseling, group therapy). Furthermore, no test for significance of difference was possible because of small sample sizes. Subjects with one or more prior DWI arrests were helped by referral to DRB and whatever subsequent treatments were initiated. First-year percent recidivism (noncrash arrests) for those referred to DRB with one or more prior arrests were one-third to one-half of the percent recidivism for subjects not referred to DRB. Percent recidivism (noncrash arrests) for subjects with zero prior arrests increased with increasing (worsening) profile levels; however, for subjects with one to three prior arrests, percent recidivism (noncrash arrests) decreased with increasing profile levels. This suggests again that DRB exposure, more likely for those with prior arrests and worse profiles, had an effect in reducing recidivism. Percent recidivism in crash arrests was

far more noncrash arrests than crash arrests.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-6-1973; 1974; 88p
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 859

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1973. SECTION 1, OVERALL ASAP PROGRESS

The City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) operational data show that, while total traffic accidents increased substantially from the previous year, there was a reduction of those labeled alcohol-related. A substantial amount of arraignment data was lost to the computer. Court case backlog continued to grow as ASAP arrest activity increased. Pretrial disposition conferences were begun in the courts in April. The prosecutor's office indulged in massive plea bargaining. Entry into the reeducation/rehabilitation portion of the ASAP system was not made a condition for reduction of the driving while intoxicated (DWI) charge. Those who could afford private attorneys to beat the system were quite successful in doing so; consequently, those being sent into treatment came to consist mainly of blue collar workers and laborers. The crisis intervention and volunteer probation programs were quite active. It became clear that more courtrooms were necessary. Improvements were sought in data collection, interpretation, and reporting techniques. A household survey made in Spring 1974 showed that more people were aware of blood alcohol level and its relationship to driving ability. Media support continued to be gratifying. The ASAP program received funding for extension of its activities throughout 1974. Budgets of the various parts of ASAP were underexpended to various degrees. Supplemental information presented includes a management summary of ASAP ultimate performance measures, a profile of drivers arrested for DWI (driving while intoxicated) in 1972 and 1973, an analysis of Phoenix police officer involvement in City Court operations during 1973, and an excerpt from 1973 Analytic Study 5, An Analysis of Drinker Diagnosis and Referral Activity.

Office of the City Manager, Phoenix, Ariz.
Contract DOT-HS-052-1-068
Rept. No. Annual-Report-1973; 1974; 127p 10refs
Availability: Reference copy only

HS-802 860

IN-DEPTH COUNTERMEASURE REPORT ON SELECTED COUNTERMEASURES NOT COVERED SEPARATELY IN ANALYTIC STUDIES. 1973 ANNUAL REPORT, SECTION 2

A report is made on selected programs in the City of Phoenix, Ariz., Alcohol Safety Action Proj., including highlights, an analysis of expenditures, and an individual countermeasure analysis for each one: chemical testing, legislation and regulation, public information and education, prosecutor's staff, crisis intervention, transportation assistance, and volunteer probation program. Objectives of the chemical testing program

were essentially met during the year; these were to improve the identification of driving while intoxicated (DWI) and other alcohol-involved drivers and to increase on-street patrol time through on-the-scene chemical testing. The legislative and regulatory activity worked toward achieving greater public support for desired alcohol-related legislation. The prosecutor's staff worked to facilitate and expedite special procedures for trying jury and nonjury DWI cases, and referring convicted DWI's into rehabilitation programs as quickly as possible; the rising incidence of plea bargaining during the year necessitates new planning. The objective of the crisis intervention program is to provide an emergency counseling and referral service concerning alcohol-related matters for problem drinkers and problem drinking-drivers; transportation assistance provides emergency transportation for individuals too intoxicated to drive. The DWI volunteer probation program tries to maintain contact and establish rapport with the convicted DWI offender both during and after his short-term rehabilitative period. Its primary method is the matching of "volunteer probation partners" on a one-to-one basis with DWI probationers, an activity which functioned well during the year, building up a stable group of volunteers.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz.; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Annual-report-1973-Sec-2; 1974; 38p
Availability: Reference copy only

HS-802 861

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. 1973 ANNUAL REPORT. SECTION 3, APPENDIX H, EVALUATION DATA TABLES

Statistical data are tabulated on a quarterly basis for the 1973 operations of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP). Subjects of the tables include the following: total project impact (survey data, financial and personnel); fatal single and multivehicle crashes excluding pedestrians, fatal pedestrian crashes, total fatal crashes; single vehicle and multivehicle injury excluding pedestrian crashes, pedestrian injury crashes, total injury crashes; crash data; blood alcohol concentration (BAC) data for drivers killed, arrested for alcohol-related (A/R) offenses; enforcement, financial and personnel; ASAP patrol activity and regular patrol activity by time of day; judicial (financial data), disposition of A/R traffic arrests, and background investigation activity; rehabilitation, financial and personnel; medical psychological, diagnosis and review activity; rehabilitation program status; driver license record review; and public information and education activity summary.

City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ., Evaluation Res. Team
Contract DOT-HS-052-1-068
Rept. No. Annual-Report-1973-Sec-3; 1974; 91p
Subcontracted to Arizona State Univ.
Availability: Reference copy only

HS-802 862

AN ANALYSIS OF TOTAL PROJECT IMPACT

An evaluation is presented of total project impact for 1974

tion Proj. (ASAP), chiefly by analysis of motor vehicle crashes as the ultimate performance measure by which project impact can be determined. Two approaches were used. First, accident patterns during 1974 were compared with crash trends established during ASAP's baseline and prior operational years, using a spectral density forecasting computer program known as GECAST (Version 4567). Second, accident trends were compared between baseline and operational periods to assess overall ASAP influence on crash rates during the full three-year active period. Statistically reliable changes in total crash frequencies were observed both between baseline and operational periods of ASAP, and between calendar year 1974 and preceding years. In addition, a number of crash subsets were inspected and several exhibited statistically significant reductions during the operational period. Total injury crashes, adjusted for vehicular mileage, showed a statistically significant decrease in level during the overall operational period. The Phoenix ASAP has produced a measurable reduction in injury and total crash rates, and subsets of these crash series, during its 1972-1974 operational period. Other tests indicated that the ASAP has not had an appreciable effect in lowering the blood alcohol concentration (BAC) distributions of fatally injured drivers. A comparison of profiles of sober drivers and pedestrians involved in fatal accidents in the City between 1969 and 1974 with profiles of persons who had been drinking reveals that the profile of the alcohol-involved driver remained relatively stable between baseline and operational periods, and generally confirmed expectations concerning profile differences between alcohol-related and sober drivers based on previous national research.

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit, 251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-1-1974; 1975; 234p 12refs
Availability: Reference copy only

HS-802 863

AN ANALYSIS OF ASAP PATROL ACTIVITY

An evaluation of the enforcement countermeasures operational during 1974 as part of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) first provides an overview of driving while under the influence (DWI) enforcement activity. Of the Phoenix Police Dept. and Arizona Dept. of Public Safety patrols, one police motorcycle squad, designated as ASAP, emphasized detection and apprehension of DWI offenders. Selection and training of the ASAP officers are described, as well as the sector rotation plan, whereby the special squad moved systematically among ten areas of the City in order to gauge squad impact, and DWI enforcement strategies practiced by ASAP officers. A detailed listing of DWI arrest and booking procedures is given. The effort, performances, and efficiency measures for the various enforcement groups are reported. Total DWI citations numbered 8295 for 1974, down 7% from 1973 but showing an upward trend during the last months of the year. The ASAP squad accounted for 27% of these arrests. An estimated 1.8% of the licensed drivers residing in the City were cited for DWI during the year. The processing time required to complete a DWI arrest ranged from 58 to 102 minutes, averaging 81 minutes. The average BAC was .162 for ASAP arrests compared to .184 for non-ASAP arrests (10% refused to submit to a test). One out of every five DWI arrests involved an accident. Cost incurred by the ASAP squad in making a DWI arrest was \$61 in 1974, lower than the \$85 for 1973 and the \$63 for 1972. Comparisons are also made

lowered performances in other duties; however they actually made more criminal arrests than the regular contingent.

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit.,
251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-3-1974; 1975; 99p 3refs
Availability: Reference copy only

HS-802 864

AN ANALYSIS OF JUDICIAL SYSTEM PERFORMANCE

A descriptive evaluation is given of the judicial countermeasures operational during 1974 as part of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP). An overview of the Project is presented, with a description of the major program areas. As several major program changes occurred in midyear, with radically different judicial referral processes and rehabilitation modalities being instituted, two system descriptions and detailed flow charts are given. A detailed description is provided of the major elements involved in the adjudication of driving while under the influence (DWI) cases, highlighting the quasidiversionary PACT (Prosecution Alternative to Court Trial) program introduced in Aug 1974. The primary evaluative topic is a descriptive analysis of judicial system performance related to DWI case adjudication. Hand-tabulated data were drawn from the Prosecutor's Office records and a one-month sample of the ASAP computer master file. Topics covered are: throughput efficiency, sanctions, dispositional outcomes by court division, number of amended and companion charges and number of continuances to disposition. Comparisons between ASAP and non-ASAP adjudicated cases are also included. These data reveal that adjudication of DWI cases in 1974 resulted in just 3% of the total caseload receiving a trial, while four out of five cases received a plea bargain (61% by dismissal of the DWI charge and 22% by dismissal of other charges). Ten percent had all charges dismissed, while the remaining 4% changed their DWI plea to guilty. Most noteworthy is the 79% reduction in the DWI trial backlog during the year, from 972 at the end of 1973 to 206 one year later. Appeals pending Superior Court attention were cut in half during the same period. These reductions were made without any corresponding drop in the number of DWI cases entering the judicial system, indicating that Court processing of DWI cases became more efficient during 1974.

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit.,
251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-4-1974; 1975; 122p 4refs
Availability: Reference copy only

HS-802 865

ANALYSES OF DRINKER DIAGNOSIS AND REFERRAL ACTIVITY AND ALCOHOL REHABILITATION EFFORTS

An evaluation is presented of drinker diagnosis and referral activity and rehabilitation countermeasures for 1974 operations of the City of Phoenix, Ariz., Alcohol Safety Action Proj.

reviewed; referral to rehabilitation was made solely contingent on the first-stage screening decision of the problem or social drinker; and Driving While Intoxicated (DWI) Prevention Workshops replaced the DWI School as the primary educational/rehabilitation referral resource for clients entering the ASAP system. Analysis was made of DWI arrest recidivism, with comparisons between treatment/no treatment groups, between randomly assigned DWI school and control groups, and between DWI Prevention Workshops and its closest counterpart (the DWI School four-session group). Highly significant differences were obtained in eight of nine treatment/no treatment comparisons. Results for problem drinkers showed significantly lower recidivism for the group not referred for treatment, while for social drinkers those completing some form of treatment were found to have a significantly lower recidivism rate over time. Generally, findings did not support the hypothesis that greater treatment exposure would result in lower recidivism. Differences were also obtained in five of six comparisons between DWI Prevention Workshops and the four-session DWI School. Problem drinker differences favoring the Workshops were highly significant at both exposure periods (6 and 12 months) while for social drinkers, significant differences in the same direction appeared only at the longer exposure time.

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit.,
251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Analytic-Study-5-1974; Analytic-Study-6-1974; 1975;
154p 6refs
Availability: Reference copy only

HS-802 866

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT TELEPHONE SURVEY. FINAL REPORT

Impact of current activities of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) on the public's attitude towards drinking and driving was determined, and baseline data were formulated which could be used in evaluating future activities of ASAP. A total of 500 randomly selected telephone interviews were conducted with persons living within the boundaries of Phoenix, an equal number with male and female respondents, and with an age profile reflective of the proportions in the city. Drunk driving was rated as either an extremely or very important problem by 93%, placing the problem just below crime in the streets and ahead of drug abuse in the public's rating of national problems. Of the three quarters of respondents who said that in the past three months they had been in a place where alcoholic beverages were served, 51% said they were involved in such a situation at least once a week. Of the 500, 349 had been exposed to drinking situations at least once a month during the past three months, and these constituted the base group for the core of the questionnaire. A large number are ill-informed about the relative effects of alcohol. Forty-two percent had been in a situation during the past year in which a drunk person was about to drive; of this group, 68% took some kind of action to prevent this, usually to drive the intoxicated person home themselves. About three quarters of the respondents had seen or heard drinking and driving advertising in the past few months; 84% recalled it on television and 22% on radio, while 33% recalled seeing it on

other media (billboards, newspapers). Of the respondents who had viewed the advertisements, 52% said that as a result they would be more likely in future to try to prevent a drinking person from driving, and persons who had seen the advertising were more likely than those who had not to take such action. Of the five government-oriented measures for reducing drunk driving accidents that were suggested to the group, the measure felt most likely to be effective was the special alcohol education course for convicted drunk drivers. Nearly 80% of the respondents said they currently drank alcoholic beverages; the majority viewed themselves as light drinkers and said they rarely if ever drove after drinking. A copy of the questionnaire is appended.

City of Phoenix Alcohol Safety Action Proj., Phoenix, Ariz.; Behavior Res. Center, Inc., Phoenix, Ariz.
Contract DOT-HS-052-1-068
1975; 62p
Subcontracted to Behavior Res. Center.
Availability: Reference copy only

HS 802 867

A SURVEY OF ATTITUDES IN PHOENIX RELATING TO PROBLEMS INVOLVING ALCOHOL AND DRINKING DRIVERS

The fourth of four surveys was conducted in Apr 1975 to measure the effectiveness of the Alcohol Safety Countermeasures Prog. (ASAP) in Phoenix. Numerous comparisons of the results of the four surveys are included. The survey was conducted with a modified random sample design of a minimum 500 respondents drawn to represent a cross section of Phoenix residents. Although awareness of programs for reducing alcohol-related traffic deaths had decreased slightly, much positive project impact was evidenced; the number of drinking drivers had been cut by nearly one third, and there were actual decreases in alcohol-related accidents. Various false ideas associated with drinking were weakened, and there was a tendency for former drinkers to abstain for greater periods. However, more women were drinking as well as drinking and driving, and the teenage segment of the driving population also showed a disturbing trend toward poor car handling and driving while intoxicated. Continuation of the educational endeavor is recommended, because of the broad public support potential indicated for the countermeasures.

City of Phoenix Alcohol Safety Action Proj., Phoenix, Ariz.; John D. Herbert and Associates, Phoenix, Ariz.
Contract DOT-HS-052-1-068
1975; 104p
Subcontracted to John D. Herbert and Associates.
Availability: Reference copy only

HS-802 868

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1974. SECTION 3, APPENDIX H, DATA TABLES

Statistical data for the 1974 operations of the City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP), are tabulated on a quarterly basis. Tables provide information on the following: responses from key household surveys on drinking and driving; personnel and financial records, by countermeasure; fatal

vehicle excluding pedestrians, pedestrian only, and total fatal crashes; injury crashes occurring in Phoenix by time of day and day of week, broken down by single vehicle excluding pedestrians, multivehicle excluding pedestrians, pedestrians only, and total injury crashes; number killed and injured in fatal crashes; number of crashes in which alcohol was involved; blood alcohol concentration (BAC) for all drivers killed in fatal crashes occurring in Phoenix, by month; BAC data for all drivers arrested each month by type of crash (fatal, injury, property damage only, none); driving while intoxicated (DWI) arrest data for the ASAP patrol, by time of day; DWI arrests by day of week, distribution of BAC readings obtained, and implied consent refusals; judicial disposition of DWI arrests; background investigation activity for drivers arrested for DWI, including the rehabilitation treatment decision reached (data broken down by drinker type: problem, nonproblem, or unidentified); diagnosis and review activity for drivers arrested for DWI; rehabilitation program status report (number of persons entering, completing, or dropping out of major treatments during a quarter, by drinker type); annual recidivism report (by type of rehabilitation treatment); driver license record review activity; and summary of public information and education activity.

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit, 251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Annual-Report-1974-Sec-3-App-H; 1975; 212p
Availability: Reference copy only

HS-802 869

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1974. SECTION 1, OVERALL ASAP PROGRESS

Total impact of the City of Phoenix, Ariz., Alcohol Safety Action Proj. was considered significant for 1974 in terms of injury crashes, property damage crashes, and total crashes which were down from the previous year. Probably the single most innovative feature for 1974 is PACT, or Prosecution Alternative to Court Trial. Undertaken as a pilot experiment, the City chartered a new course for the adjudication of driving while intoxicated (DWI) cases. Initial experience with PACT has been quite favorable. Another change was the withdrawal of the Phoenix DWI School as a primary countermeasure in the ASAP system. The alcohol awareness education/short-term rehabilitation modalities were totally restructured. Public information and education activities were very creative in Phoenix throughout 1974. Among these activities were an ASAP-sponsored, youth-oriented rock and country western musical which relayed the message about the dangers of excessive drinking and driving; continuing speakers' bureau appearances before civic groups; many news releases about ASAP activities; distribution of nationally produced television spots with local tags; and a billboard art contest in the local high schools. Upon expiration of an evaluation contract with Arizona State Univ., all local ASAP evaluation was moved in-house to the City's computer and an expanded evaluation section. Finally, the Phoenix ASAP was selected for a two-year extension of Federal 403 funding, which allowed the continuation of certain Federally-backed programs, ASAP management and evalua-

tion, plus the capability of expanded efforts to evaluate rehabilitation countermeasures.

City of Phoenix Alcohol Safety Action Proj., 251 W. Washington St., Phoenix, Ariz. 85003
Contract DOT-HS-052-1-068
Rept. No. Annual-Report-1974-Sec-1; 1975; 89p
For Technical Summary, see HS-802 870.
Availability: Reference copy only

HS-802 870

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1974. TECHNICAL SUMMARY

by Moya G. Easterling; Eugene J. Neff
Office of the City Manager, Phoenix, Ariz.
Contract DOT-HS-052-1-068
1975; 24p
For abstract see 1974 Annual Rept., HS-802 869.
Availability: Reference copy only

HS-802 871

EFFECTIVENESS OF PHOENIX ASAP [ALCOHOL SAFETY ACTION PROJECT] SCREENING PROCEDURES AND SHORT-TERM REHABILITATION PROGRAMS FOR PROBLEM DRINKING DRIVERS: A COMPILATION OF RESEARCH

Four research studies were made pertaining to the effectiveness of problem drinker screening procedures and the impact of various short-term rehabilitation programs in bringing about change in clients' problem drinking behavior. The first study, entitled "Utility of a Screening Procedure to Identify Problem Drinking Drivers," is concerned with the effectiveness of the Data Collection I (DCI) screening procedure in identifying problem drinkers. The program appears to be successful in identifying clients who are problem drinkers but is somewhat limited in that not all problem drinkers are identified (40% of not-selected group rated as problem drinkers). The selection procedure is best seen as a screening device rather than a diagnostic instrument. The second study, entitled "Development of a Quick Procedure for Identification of High Risk Problem Drinking Drivers," described a procedure used to reduce the length of the DCI screening instrument. This procedure, although in need of cross-validation on a new sample, was found to replicate the previously used clinical decisionmaking process at an acceptable level of accuracy and was found to be quicker to administer and score. The third study, entitled "A Three Month Follow-up of DWI Clients Referred to Court Mandated Rehabilitation," concerns an experimental (treatment)/control pre-post interview design to investigate the effectiveness of court-mandated, short-term rehabilitation programs in bringing about change in DWI (driving while intoxicated) clients' problem drinking behavior. The major finding was a lack of any significant difference in pre-post change scores for the experimental vs. the control group as assessed by a one-way analysis of variance. The fourth and final study, entitled "Attendance at Court Ordered Rehabilitation for Problem Drinking D.W.I.'s: A Study in Client Change in Attitudes

programs. Results of the analysis of client characteristics, as expected, indicated that there were differences between clients assigned to different treatments. The finding that none of the variables pertaining to client characteristics was related to attendance at treatment was somewhat surprising.

by Irwin Sandler; Sydney Palmer; Martin Holmen
City of Phoenix Alcohol Safety Action Proj., 251 W. Washington St., Phoenix, Ariz. 85003; St. Luke's Hosp. Medical Center, Diagnostic Review Board, Phoenix, Ariz.
Contract DOT-HS-052-1-068
1975; 92p 18refs
Subcontracted to St. Luke's Hosp. Medical Center.
Availability: Reference copy only

HS-802 872

IMPACT OF THE ALCOHOL SAFETY ACTION PROJECT HOLIDAY CAMPAIGN: "FRIENDS DON'T LET FRIENDS DRIVE DRUNK"

An assessment was made of the extent to which the 1975 City of Phoenix, Ariz., Alcohol Safety Action Proj. (ASAP) holiday public information and education campaign impacted the residents of six selected census tracts in Phoenix. Specifically, the study focused on campaign awareness, message recall, and drunk-driver intervention behavior of residents within the selected areas. The holiday advertising campaign was based on the National Hwy. Traffic Safety Administration's (NHTSA's) "Friends Don't Let Friends Drive Drunk" intervention campaign. A total of 900 randomly selected telephone interviews were conducted with persons living within the boundaries of the six census tracts in Phoenix. The interviewing was conducted 5-16 Jan 1976, during an equal proportion of daytime and evening hours. An equal number of interviews were conducted with male and female respondents. Seven out of every ten respondents were aware of the advertising and public relations campaign. The basic thematic messages contained in the campaign were recalled by respondents and in a majority of cases, respondents aware of the campaign claimed they are now more likely to intervene in drunk driving situations than they were in the past. Among those people in the test areas who recalled receiving a copy of the ASAP "Be My Guest" Party Planner, the data indicate that the brochure had a positive influence on their knowledge about the effects of alcohol and their inclination to intervene to prevent a drunk from driving. Unfortunately, because of limited time and resources, the Party Planner distribution effort did not effectively "saturate" households in the target area. Had a saturation been achieved, it is believed that campaign awareness, knowledge levels, and likelihood to intervene to prevent drunk driving would have been more noticeable in the test areas.

City of Phoenix Alcohol Safety Action Proj.; Behavior Res. Center, Inc., P.O. Box 13178, Phoenix, Ariz. 85002
Contract DOT-HS-052-1-068
1976; 107p
Subcontracted to Behavior Res. Center.
Availability: Reference copy only

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CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. 1973 ANNUAL REPORT. SECTION 3, APPENDIX H, EVALUATION DATA TABLES

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City of Phoenix Alcohol Safety Action Proj., 112 N. Central Ave., Suite 304, Phoenix, Ariz. 85004
AN ANALYSIS OF THE JUDICIAL DISPOSITION OF ALCOHOL RELATED TRAFFIC ARRESTS

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City of Phoenix Alcohol Safety Action Proj., 251 W. Washington St., Phoenix, Ariz. 85003

CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1974. SECTION 1, OVERALL ASAP PROGRESS

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EFFECTIVENESS OF PHOENIX ASAP [ALCOHOL SAFETY ACTION PROJECT] SCREENING PROCEDURES AND SHORT-TERM REHABILITATION PROGRAMS FOR PROBLEM DRINKING DRIVERS: A COMPILATION OF RESEARCH

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City of Santa Barbara, Transportation Div.

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Department of California Hwy. Patrol

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Department of Energy, Transportation Branch,

Washington, D.C. 20545

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Indiana State Hwy. Commission

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THE PUBLIC INEBRIATE AND THE HIGHWAY TRANSPORTATION SYSTEM

SWITZERLAND DURING 1970
 Institute for Safety Analysis, 6400 Goldsboro Rd.,
 Washington, D.C. 20034
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Inter-Tribal Council of Nevada
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 MEASUREMENT AND ANALYSIS OF TRUCK POWER
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John D. Herbert and Associates, Phoenix, Ariz.
 A SURVEY OF ATTITUDES IN PHOENIX RELATING
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 Va. 22304
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Libby Owens Ford Co.
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Lincoln Alcohol Safety Action Proj., City of Lincoln,
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 Room 812, Lincoln, Nebr.
 LINCOLN ALCOHOL SAFETY ACTION PROJECT.
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 ROADSIDE SURVEY, 1971 - 1972 - 1973. PRELIMINARY
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Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
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LINCOLN ALCOHOL SAFETY ACTION PROJECT.
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AN ANALYSIS OF ASAP [ALCOHOL SAFETY ACTION PROJECT] PATROL ACTIVITY

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Loctite Corp.

BONDING WITH ANAEROBIC ADHESIVES IN THE AUTOMOTIVE INDUSTRY

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Maryland Dept. of Transportation, Motor Vehicle Administration, Glen Burnie, Md. 21062

MOTOR VEHICLE INSPECTION STUDY FOR THE STATE OF MARYLAND

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McBer and Co., Substance Abuse Programs, 137 Newbury St., Boston, Mass. 02116

A COMPARATIVE STUDY OF THE EFFECT OF THE VERMONT ALCOHOL SAFETY ACTION PROJECT (PROJECT CRASH)

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TRUCK AND BUS SIZES AND WEIGHTS. 1977 EDITION

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National Conference of Governors' Hwy. Safety Representatives

STATEMENT OF THE NATIONAL CONFERENCE OF GOVERNORS' HIGHWAY SAFETY REPRESENTATIVES BEFORE THE SURFACE TRANSPORTATION SUBCOMMITTEE OF THE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION OF THE U.S. HOUSE OF REPRESENTATIVES

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NATIONAL TRAINING COURSE: EMERGENCY MEDICAL TECHNICIAN, PARAMEDIC. INSTRUCTOR'S LESSON PLANS. MODULE 11. OBSTETRIC/GYNECOLOGIC EMERGENCIES

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National Hwy. Traffic Safety Administration, Safety Res. Lab.

DYNAMIC CHARACTERISTICS OF HUMAN LEG JOINTS

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National Hwy. Traffic Safety Administration, Safety Res. Lab., 6501 Lafayette Ave./Bldg. 2, Riverdale, Md. 20840

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Naval Construction Battalion Center, Civil Engineering Lab., Calif.

INTRACRANIAL PRESSURE DYNAMICS DURING HEAD IMPACT

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Office of the City Manager, Phoenix, Ariz.

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CITY OF PHOENIX ALCOHOL SAFETY ACTION PROJECT. ANNUAL REPORT 1974. TECHNICAL SUMMARY

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Oregon Alcohol Safety Action Proj., Oregon State Div. of Mental Health

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Oregon Problem Drinker--Traffic Fatality Proj., Oregon State Div. of Mental Health

AN ANALYSIS OF BAC DATA FOR DRIVERS FATALLY INJURED

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AN ANALYSIS OF ASAP PATROL ACTIVITY

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Oregon Problem Drinker-Traffic Fatality Proj., Oregon State Div. of Mental Health

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Oregon State System of Higher Education, Teaching Res. Div., Monmouth, Ore.

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Organisme National de Securite Routiere (ONSR), Laboratoire des Chocs et de Biomecanique, France

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EVALUATION OF THE PHOENIX ALCOHOL SAFETY
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Porsche Res. and Development Center, Germany

BIOCHEMICAL EXPERIMENTS WITH ANIMALS ON
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Project CRASH, Vermont [Dept. of Mental Health],

Waterbury, Vt. 05676

A COMPARATIVE STUDY OF THE EFFECT OF THE
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Project CRASH, Vermont Dept. of Mental Health,

Montpelier, Vt.

EVALUATION OF A PROGRAM TO REDUCE
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Project CRASH, Vermont Dept. of Mental Health,

Waterbury, Vt.

ALCOHOL-IMPAIRED DRIVING LICENSE SUSPEN-
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Project CRASH, Vermont Dept. of Mental Health,

Waterbury, Vt. 05676

VERMONT ASAP [ALCOHOL SAFETY ACTION PRO-
JECT] ANNUAL REPORT, MARCH 1972

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Project CRASH, Vermont Dept. of Mental Health,

Waterbury, Vt.

PREVIOUS POLICE CONTACTS, AND RECIDIVISM
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Project CRASH, Vermont Dept. of Mental Health,

Waterbury, Vt. 05676

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JECT] ANNUAL REPORT 1974. SECTION I

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**Purdue Univ., Joint Hwy. Res. Proj., West Lafayette,
Ind.**

APPLICATION OF THE UTCS-1 NETWORK SIMULA-
TION MODEL TO SELECT OPTIMAL SIGNAL
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PRD Electronics Div.

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**Raymond Poincare Hospital, Inst. of Orthopaedical Res.,
France**

BELTED OR NOT BELTED: THE ONLY DIFFERENCE
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Rochester General Hospital, Dept. of Orthopedics

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Society of Automotive Engineers, Inc.

STAPP CAR CRASH CONFERENCE (21ST)
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Southwest Res. Inst.

ARLINGTON ALCOHOL SAFETY ACTION PROGRAM
EVALUATION OF 1974 OPERATIONS. FINAL REPORT

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St. Luke's Hosp. Medical Center, Diagnostic Review**Board, Phoenix, Ariz.**

EFFECTIVENESS OF PHOENIX ASAP [ALCOHOL
SAFETY ACTION PROJECT] SCREENING
PROCEDURES AND SHORT-TERM REHABILITATION
PROGRAMS FOR PROBLEM DRINKING DRIVERS: A
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St. Luke's Hosp. Medical Center, ASAP Diagnostic**Review Board, Phoenix, Ariz.**

AN ANALYSIS OF PROBLEM DRINKER DIAGNOSIS
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Swiss Federal Inst. of Tech., University of Zurich

ADVERSE EFFECTS OF SEAT BELTS AND CAUSES
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**Technische Universitat, Inst. of Automotive Engineering,
Berlin, Germany**

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Transport and Rd. Res. Lab., Accident Investigation**Div., Crowthorne, Berks., England**

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**Transport and Rd. Res. Lab., Crowthorne, Berks.,
England**

A REANALYSIS OF CALIFORNIA DRIVER VISION
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University of Birmingham, Dept. of Transportation and**Environmental Planning, Birmingham, England**

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University of California -- San Diego

STAPP CAR CRASH CONFERENCE (21ST)
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**University of California, Dept. of Surgery, San Diego,
Calif.**

INTRACRANIAL PRESSURE DYNAMICS DURING
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**University of California, School of Engineering and
Applied Science, Los Angeles, Calif.**

A REANALYSIS OF CALIFORNIA DRIVER VISION
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University of Detroit

OPTIMIZATION STUDY OF LIQUID-TO-AIR HEAT
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University of Houston

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University of Maryland, Mechanical Engineering Dept.

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University of Michigan, Hwy. Safety Res. Inst.

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HEAD IMPACT RESPONSE

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STAPP CAR CRASH CONFERENCE (21ST)
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THE TREND TO SMALLER AND LIGHTER CARS--
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**University of Michigan, Hwy. Safety Res. Inst., Ann
Arbor, Mich. 48109**

SAFETY HELMET-HEAD INTERACTION STUDY
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**University of Michigan, Hwy. Safety Res. Inst., Huron
Pkwy. and Baxter Rd., Ann Arbor, Mich. 48109**

CAR-TRUCK FATAL ACCIDENTS IN MICHIGAN AND
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**University of North Carolina, Hwy. Safety Res. Center,
Chapel Hill, N.C.**

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EVALUATION OF AN EDUCATIONAL PROGRAM FOR
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**University of Zurich, Inst. for Forensic Medicine,
Switzerland**

ADVERSE EFFECTS OF SEAT BELTS AND CAUSES
OF BELT FAILURES IN SEVERE CAR ACCIDENTS IN
SWITZERLAND DURING 1976

HS-021 784

Vermont Alcohol Safety Action Prog. CRASH

AN ANALYSIS OF ASAP PATROL ACTIVITY

HS-802 782

AN ANALYSIS OF ASAP PATROL ACTIVITY

HS-802 789

AN ANALYSIS OF DRINKER DIAGNOSIS AND
REFERRAL ACTIVITY

HS-802 784

AN ANALYSIS OF THE IMPACT OF ASAP ON THE
TRAFFIC SAFETY SYSTEM

HS-802 783

HIGHWAY CRASHES AND ALCOHOL COUNTERMEASURES:
SECOND INTERIM REPORT

HS-802 781

RECIDIVISM AMONG PERSONS ARRESTED FOR
DRIVING WHILE IMPAIRED BY ALCOHOL - INTERIM
REPORT NO. 2

HS-802 785

Vermont Alcohol Safety Action Proj.

VERMONT ASAP [ALCOHOL SAFETY ACTION PROJECT]
1974 ANNUAL [REPORT] APPENDIX H, TABLES

HS-802 787

Volkswagenwerk AG, Res. and Devel., Germany

VOLKSWAGEN'S PASSIVE SEAT BELT/KNEE
BOLSTER RESTRAINT, VWRA: A PRELIMINARY
FIELD PERFORMANCE EVALUATION

HS-021 802

Wagner Electric Corp.

MODIFICATIONS OF STEERING AXLE CAM BRAKES
FOR FMVSS 121

HS-021 763

Wayne State Univ.

STAPP CAR CRASH CONFERENCE (21ST)
PROCEEDINGS, OCTOBER 19-21, 1977, NEW ORLEANS,
LOUISIANA

HS-021 782

Williams Advertising Agency

PUBLIC INFORMATION AND EDUCATION SUMMARY

HS-021 816

**619 Henry Bldg., 309 S.W. Fourth Ave., Portland Oreg.
97204**

PUBLIC INFORMATION AND EDUCATION SUMMARY

HS-021 816

DOT-FH-11-8242

JHK and Associates, 4660 Kenmore Ave., Alexandria, Va.
22304

HS-021 865

DOT-HS-044-01-060

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 805

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 806

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 807

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 808

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 816

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 827

Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
HS-802 813

Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
HS-802 823

Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
HS-802 828

DOT-HS-044-1-060

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 810

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 814

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 817

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 818

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 819

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 820

Lincoln Alcohol Safety Action Proj., City of Lincoln, Nebr.
HS-802 822

Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room
812, Lincoln, Nebr.

HS-802 811

Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room
812, Lincoln, Nebr.

HS-802 812

Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room
812, (Lincoln, Nebr.)

HS-802 821

Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
HS-802 824

Lincoln Alcohol Safety Action Proj., Lincoln Bldg., Room
812, Lincoln, Nebr.

HS-802 825

Lincoln Alcohol Safety Action Proj., Lincoln, Nebr.
HS-802 826

Lincoln Safety Alcohol Action Proj., 812 Lincoln Bldg., Lin-
coln, Nebr.

HS-802 825

DOT-HS-052-1-058

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004

HS-802 854

DOT-HS-052-1-068

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ.,
Evaluation Res. Team

HS-802 850

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ.,
Evaluation Res. Team

HS-802 851

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Phoenix, Ariz.; Arizona State Univ., Evaluation Res.
Team; St. Luke's Hosp. Medical Center, ASAP Diagnostic
Review Board, Phoenix, Ariz.

HS-802 852

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85003; Arizona State Univ.,
Evaluation Res. Team

HS-802 855

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ.,
Evaluation Res. Team

HS-802 856

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ.,
Evaluation Res. Team

HS-802 857

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Phoenix, Ariz. 85004; Arizona State Univ., Evaluation
Res. Team

HS-802 858

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz.; Arizona State Univ.,
Evaluation Res. Team

HS-802 860

City of Phoenix Alcohol Safety Action Proj., 112 N. Central
Ave., Suite 304, Phoenix, Ariz. 85004; Arizona State Univ.,
Evaluation Res. Team

HS-802 861

City of Phoenix Alcohol Safety Action Proj., Evaluation
Unit, 251 W. Washington St., Phoenix, Ariz. 85003

HS-802 862

City of Phoenix Alcohol Safety Action Proj., Evaluation
Unit., 251 W. Washington St., Phoenix, Ariz. 85003

HS-802 863

City of Phoenix Alcohol Safety Action Proj., Evaluation
Unit, 251 W. Washington St., Phoenix, Ariz. 85003

HS-802 864

City of Phoenix Alcohol Safety Action Proj., Evaluation
Unit, 251 W. Washington St., Phoenix, Ariz. 85003

HS-802 865

City of Phoenix Alcohol Safety Action Proj., Phoenix, Ariz.;
Behavior Res. Center, Inc., Phoenix, Ariz.

HS-802 866

City of Phoenix Alcohol Safety Action Proj., Phoenix, Ariz.;
John D. Herbert and Associates, Phoenix, Ariz.

HS-802 867

City of Phoenix Alcohol Safety Action Proj., Evaluation Unit, 251 W. Washington St., Phoenix, Ariz. 85003	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 868	HS-802 773
City of Phoenix Alcohol Safety Action Proj., 251 W. Washington St., Phoenix, Ariz. 85003	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 869	HS-802 774
City of Phoenix Alcohol Safety Action Proj., 251 W. Washington St., Phoenix, Ariz. 85003; St. Luke's Hosp. Medical Center, Diagnostic Review Board, Phoenix, Ariz.	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 871	HS-802 775
City of Phoenix Alcohol Safety Action Proj.; Behavior Res. Center, Inc., P.O. Box 13178, Phoenix, Ariz. 85002	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 872	HS-802 776
Office of the City Manager, Phoenix, Ariz.	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 859	HS-802 777
Office of the City Manager, Phoenix, Ariz.	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
HS-802 870	HS-802 778
DOT-HS-356-3-719	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
Boeing Computer Services, Inc.; National Hwy. Traffic Safety Administration	HS-802 779
HS-021 775	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.
DOT-HS-4-00882	HS-802 780
Adaptronics, Inc.; National Hwy. Traffic Safety Administration	Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt. 05676
HS-021 791	HS-802 786
DOT-HS-5-01201	Vermont Alcohol Safety Action Prog. CRASH
New Mexico State Univ., Physical Science Lab., N. Mex.	HS-802 781
HS-021 668	Vermont Alcohol Safety Action Prog. CRASH
DOT-HS-5-01254	HS-802 782
Calspan Corp.; National Hwy. Traffic Safety Administration	Vermont Alcohol Safety Action Prog. CRASH
HS-021 801	HS-802 783
DOT-HS-7-01551	Vermont Alcohol Safety Action Prog. CRASH
Calspan Corp., Buffalo, N.Y. 14221	HS-802 784
HS-802 832	Vermont Alcohol Safety Action Prog. CRASH
DOT-OS-05155	HS-802 785
Institute for Safety Analysis, 6400 Goldsboro Rd., Washington, D.C. 20034	Vermont Alcohol Safety Action Prog. CRASH
HS-021 833	HS-802 789
FH-11-7543	Vermont Alcohol Safety Action Prog.
Project CRASH, Vermont [Dept. of Mental Health], Waterbury, Vt. 05676; McBer and Co., Substance Abuse Programs, 137 Newbury St., Boston, Mass. 02116	HS-802 787
HS-802 790	HPR-1(15)-Pt-1
Project CRASH, Vermont Dept. of Mental Health, Montpelier, Vt.	Purdue Univ., Joint Hwy. Res. Proj., West Lafayette, Ind.
HS-802 788	HS-021 872
Project CRASH, Vermont Dept. of Mental Health, Montpelier, Vt.	NIH-RR-3
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Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.	HS-021 809
HS-802 770	Oregon Problem Drinker-Traffic Fatality Proj., Oregon State Div. of Mental Health; Oregon Res. Inst.
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt. 05676	HS-021 810
HS-802 771	Oregon Problem Drinker-Traffic Fatality Proj., Oregon State Div. of Mental Health; Oregon Res. Inst.
Project CRASH, Vermont Dept. of Mental Health, Waterbury, Vt.	HS-021 811
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	HS-021 812
	Oregon Problem Drinker-Traffic Fatality Proj., Oregon State Div. of Mental Health; Oregon Res. Inst.
	HS-021 813

april 30, 1978

Oregon Problem Drinker-Traffic Fatality Proj., Oregon State
Div. of Mental Health; Oregon Res. Inst.

HS-021 814

Oregon Problem Drinker-Traffic Fatality Proj., Oregon State
Div. of Mental Health; Oregon Res. Inst.

HS-021 815

NIOSH-RO-1-OH-00404

University of California, Dept. of Surgery, San Diego,
Calif.; Naval Construction Battalion Center, Civil Engineer-
ing Lab., Calif.

HS-021 790

NIOSH-77-12122

University of Michigan, Hwy. Safety Res. Inst., Ann Arbor,
Mich. 48109

HS-021 844

NSF-RANN-SIA74-14843

University of Maryland, Mechanical Engineering Dept.

HS-021 764

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CONTRACTS AWARDED

DOT-HS-355-3-718 Mod. 6

RURAL AND FREEWAY PEDESTRIAN ACCIDENT STUDY

Geometric and operational data from randomly selected traffic accident sites shall be collected and analyzed. This will result in exposure information which will enable the contractor to determine the relative hazardousness of all sites examined. This in turn will increase the validity of the sidewalk site selection procedure developed in Phase 3. Approximately 1500 rural and suburban, non-freeway sites will be randomly selected in the states of California, Michigan, Missouri, North Carolina, and Pennsylvania. The number of randomly chosen sites in each state will correspond to the number of accident sites already collected in each state, and the sites will be chosen from the same geographical area (county). Oeph

BioTechnology, Inc., 3027 Rosemary Lane, Falls Church, VA 22072
Increased \$53,393.00
No change.

DOT-HS-4-00955 Mod. 6

EXPERIMENTAL FIELD TEST OF PROPOSED ANTI-DART-OUT TRAINING PROGRAMS

The following work shall be completed: reorganize data to compile lists of accident victims by participating schools for the operational and post-operational periods in New Orleans, mail questionnaires to the teachers and principals of these accident victims to ascertain extent of training, conduct personal interviews with non-respondent teachers and principals, hire and train field staff to assist in the performance of Task 3, collect comparable data on the ten children hit during the post-operational period in Toledo (operational period data having been previously collected and analyzed), and perform additional analyses on these data utilizing the number of trained children who were involved in accidents during the operational and post-operational periods.

Applied Science Associates, Inc., Box 158, Valencia, Butler County, PA 16059
Increased \$3,729.00
Extended to 28 Feb 78.

DOT-HS-5-01056 Mod. 14

MOTOR VEHICLE DIAGNOSTIC INSPECTION DEMONSTRATION PROJECT

Additional analysis of Auto Check data shall be made in order to fully utilize the information in the UAH Management Information System (MIS). The objectives of this analysis are to determine the physical condition of the vehicle fleet when the public does not have access to information concerning vehicle condition and to determine the potential improvement in the condition of the vehicle fleet when such information is available. Any change in the condition of the vehicle fleet under an inspection program shall be determined, in addition to approxi-

mations of the wear-out rates of vehicle systems and components. the

State of Alabama, Executive Department, Office of Highway and Traffic Safety, Montgomery, Alabama 36104
No change
Extended to 15 Feb 78.

DOT-HS-5-01060 Task Order 15

NATIONAL CRASH SEVERITY STUDY (NCSS) DATA CONVERSION

National Crash Severity study (NCSS) data, from 801 cases of material which have been transcribed onto the latest forms being used in the study, shall be keypunched and duplicated.

Institute of Modern Procedures, 1430 K Street, N.W., Suite 600, Washington, D.C. 20005
\$2,582.00
To be completed two (2) weeks from date of task order award (26 Jan 78).

DOT-HS-5-01063 Task Order 10

WEIGHT-WHEELBASE DISTRIBUTION BY STATE PROJECT

The following work shall be completed: Key punch the information in DOT-HS-802 435 in a manner so that the information on vehicle weight and wheelbase can be added to the Records on the 3 Polk State Vehicle Distribution Tapes; using Federal Cobol, write a program to amend the tape records with the weight and wheelbase information; using designated weight and wheelbase intervals, provide a cross-tabulation of vehicle weight versus vehicle wheelbase; using the same weight intervals, produce a set of tables giving the frequency of each weight class in each state as well as the sample mean and sample variance; and using the same wheelbase intervals, produce a set of tables by state giving the frequency of each weight classification as well as the sample mean and sample variance. 0 in

Opportunity Systems, Inc., 1330 Massachusetts Ave., N.W., Washington, D.C. 20005
\$3,935.00
To be completed by 28 Jan 78.

DOT-HS-5-01106 Mod. 3

BRAIN INJURY INDICATORS IN WHIPLASH HEAD MOTIONS

As part of the continuing research effort to determine the relationship between the mechanical motions the head undergoes during an impact and the onset of concussion, the duration of concussion, and the occurrence and severity of brain lesions, a new experimental protocol shall be instituted which will allow more meaningful analysis of the resulting data. The new test matrix protocol will allow "probit and L/D 50" analysis to be performed on the test data. The intent is to determine, given a specific mechanical configuration, at what level of mechanical

intensity is the probability 50% that the clinical indicator will occur

Armed Forces Radiobiology Research Institute, Bethesda,
Maryland 20014
\$150,000.00
Extended to 30 Sep 78.

DOT-HS-6-01287 Mod. 4

ELECTROMAGNETIC INTERFERENCE/COMPATIBILITY RESEARCH

The following additional tasks shall be performed: determine the field strength levels that cause any failure modes in seven (7) FMVSS-121 antilock brake systems; endeavor to identify those failure modes and determine whether fail-safe features exist; and make near field measurement around available traffic control signal loops in order to define the worst electromagnetic environment in the 20 kHz to 200 kHz range. 0a.

U.S. Department of Commerce, National Bureau of Standards,
325 Broadway, Boulder, Colorado 80302
Increased \$30,000.00
Extended to 31 Dec 77.

DOT-HS-6-01340 Mod. 9

SAFETY BELT USAGE: SURVEY IN THE TRAFFIC POPULATION

Additional computer analysis of safety belt usage data shall be performed to include processing all data for the following parameters: age of driver by car model, usage by men and women by type of belt system installed, frequency of car models by region of country, and usage by VIN for selected vehicle models.0fic

Kirschner Associates, Inc., 733-15th Street, N.W., Suite 1137,
Washington, D.C. 20005
Increased \$1,975.00
Extended to 31 Jan 78.

DOT-HS-6-01348 Mod. 5

UNIFORM TIRE QUALITY GRADING TREADWEAR COURSE MONITORING PROGRAM

Treadwear shall be measured and data acquired for tires being tested in San Angelo, Texas, by the Safety Research Laboratory (SRL).

Southwest Research Institute, 8500 Culebra Road, San
Antonio, Texas 78284
Increased \$11,200.00
To be completed by 31 Jan 78.

DOT-HS-7-01732

COMPUTERIZATION OF HEAD AND NECK INJURY INFORMATION

A procedure shall be developed for the computerization of head and neck injury for information that can be collected, stored and readily accessed in a form suitable for statistical and modeling applications. It is envisioned that this project will lead to the eventual accumulation of a data bank on head injury - outcome that will permit inclusion of data from all cooperating research organizations into statistically valid data sets for attacks on the input-outcome problem of head-neck injury.

Naval Civil Engineering Laboratory, Port Hueneme, California
93043
\$39,000.00
To be completed six (6) months from date of contract award (4 Oct 77).

DOT-HS-7-01793

TRAINING STATE AND COMMUNITY INSTRUCTORS IN USE OF NHTSA-EMT CURRICULUM PACKAGES: PARAMEDIC, EMERGENCY VEHICLE OPERATION, DISPATCHER, EMT REFRESHER AND VICTIM EXTRACTION

It shall be arranged that a college with an established program for the training of occupational instructors shall conduct its standard course in methods and techniques of occupational teaching for state and local safety-agency instructors. The instructor training course, as described in the school's catalog, shall be adapted as necessary to make it entirely, if not exclusively, applicable to the particular content of a published traffic safety content course to be provided, e.g., Emergency Vehicle Operation. Employing the methods and techniques learned, the student-instructor will, upon course completion, train, in this example, other local operators of emergency vehicles.

Dunlap and Associates, Inc., One Parkland Drive, Darien,
Connecticut 06820
\$241,336.00
To be completed eighteen (18) months from date of contract award (30 Sep 77).

DOT-HS-7-01794

YOUTH ALCOHOL SAFETY EDUCATION CRITERIA DEVELOPMENT

A determination shall be made whether reliable and valid intermediate criteria can be developed to measure changes in drinking and driving behavior subsequent to participation in the Youth Alcohol Safety Education program, a secondary school alcohol safety program developed by the National Highway Traffic Safety Administration (NHTSA) and tailored to produce effective learning concerning alcohol and driving behavior. The following six tasks shall be performed: conduct a literature review to help isolate possible behavioral criteria,

reliability and validity of the measuring instrument, develop an administrative manual for test procedure and data collection, and develop coding form(s) for the data0ews

National Public Services Research Institute, 421 King Street, Alexandria, Virginia 22314
\$95,343.00

To be completed eighteen (18) months from date of contract award (30 Sep 77).

DOT-HS-7-01795

DEVELOPMENT OF A DISPOSABLE BREATH TESTER AND A REMOTE BREATH COLLECTION DEVICE

A disposable breath alcohol tester which will qualify at least as a screening breath tester and, if possible, also as an evidential tester according to Department of Transportation (DOT) standards; and a breath collection device which will be in agreement with the National Highway Traffic Safety Administration (NHTSA) standards, shall be developed. 0 dr

The University of Oklahoma Health Services Center, Post Office Box 26901, Oklahoma City, Oklahoma 73190
\$135,711.00

To be completed twenty-four (24) months from date of contract award (30 Sep 77).

DOT-HS-7-01796

FEASIBILITY OF DEVELOPING A MEDICAL CONDITION DATA COLLECTION SYSTEM

The feasibility shall be established of developing a data collection mechanism which may serve as an integral part of a future system designed to quantify the relationship between medical conditions and accident frequency, accident rate, and mobility of the handicapped. The tasks to be performed will include the following: identify data required for establishing criteria and information needs for medically qualifying individuals to drive, identify existing or proposed studies or data systems where medical qualifications of drivers may be obtained, and develop a system concept(s) for gathering required data and information.

Dunlap and Associates, Inc., One Parkland Drive, Darien, Fairfield, Connecticut 06820
\$98,689.00

To be completed fifteen (15) months from date of contract award (30 Sep 77).

DOT-HS-7-01797

IDENTIFICATION OF GENERAL DETERRENCE COUNTERMEASURES FOR UNSAFE DRIVING ACTIONS (NON-DISCRETE MOVING VIOLATIONS)

General deterrence countermeasures for nondiscrete moving violation unsafe driving actions (NDMVUDA's) shall be identified. The primary objectives of this project are as follows: identify potential enforcement, adjudication, social influence, public information and citizen participation counter-

measures and potential penalties for these approaches; and specify experimental procedures that could be used to determine the impact of these potential countermeasures upon the incidence of NDMVUDA's and associated accidents.

The Regents of the University of Michigan, 260 Research Administration Bldg., Ann Arbor, Michigan 48109
\$99,750.00

To be completed twelve (12) months from date of contract award (27 Sep 77).

DOT-HS-7-01800

STATE RECORDS AND INFORMATION SYSTEMS

A traffic safety problem identification model shall be developed which is based on actual statewide traffic records data; and data analysis technical assistance shall be provided to eight pilot Highway Safety Plan (HSP) States (Delaware, Florida, New Jersey, Oklahoma, South Dakota, Idaho, Nebraska, Arizona) where the DART (Data Analysis and Reporting Techniques) package will be installed. DART is a computer software statistical package designed and developed by the National Highway Traffic Safety Administration (NHTSA) to assist in the selection, analysis and evaluation of accident data. The model will be based on data analysis reports produced by the DART package. The development of the problem identification model will provide state and local highway safety planners with a ready reference set of specifications to emulate.0ion

National Con-Serv, Inc., t/a/ Safety Management Institute, 7979 Old Georgetown Road, Bethesda, Maryland 20014
\$91,703.00

To be completed nine (9) months from date of contract award (30 Sep 77).

DOT-HS-7-01801

AMBULANCE ELECTRICAL SYSTEM STUDY

All safety and operational factors relating to the generation, handling and use of electrical energy in the Federal standard ambulance shall be investigated; findings and recommendations which can be used to upgrade the existing Federal Ambulance Specifications (KKK-A-1822) shall be developed; and guidelines shall be provided for the future development and use of the ambulance. The overall goal of this study is to analyze the electrical needs of the modern ambulance and to develop a model electrical system which will be economical, safe, capable of future growth and be of maximum reliability and maintainability. To accomplish this goal it is necessary to conduct a thorough study of the electrical demands of an ambulance in urban rural service; conduct a thorough study of the ambulance electrical wiring and distributions systems with particular emphasis on load protection, bonding and leakage current integrity and develop a model "standard wiring harness"; analyze the patient compartment of a standard ambulance for electrical shock hazards with particular emphasis on the hazards of electric "microshock" to a patient undergoing life supportive treatment; and rationalize the bonding system necessary to provide patient and occupant shock protection to that which will provide the maximum reduction in electrostatic

and electromechanical noise of artifacts in on-board and telemetered voice and biomedical communications.

Research Triangle Institute, P.O. Box 12194, Research Triangle Park, North Carolina 27709
\$87,540.00

To be completed twelve (12) months from date of contract award (30 Sep 77).

DOT-HS-7-01802

DEVELOP SET OF 35MM TRAINING AIDS

Instructional 35mm 2x2 slides complementing the 15 modules of the Instructor Lesson Plans of the National Academy of Sciences' (NAS) Emergency Medical Technician - Paramedic (EMT-P) training program shall be developed and evaluated. The slides are to be based on the knowledge objectives and skill objectives listed in the Instructor Activities and Knowledge Objectives found at the beginning of each module of the Lesson Plans. of

University of Pennsylvania, Ofc. of Research Administration, 3451 Walnut street, Philadelphia, PA 19174
\$92,355.00

To be completed eighteen (18) months from date of contract award (30 Sep 77).

DOT-HS-7-01803

GUIDELINES FOR (1) DRIVER ID AND LICENSE SECURITY AND (2) SUSPENDED/REVOKED DRIVER INVOLVEMENTS

Guidelines shall be developed for use by state agencies responsible for the issuance and control of driver licenses and/or state identification cards. Such guidelines shall provide minimum standards for, but not necessarily be limited to, the identification of applicants for and the security of these documents. Also, guidelines shall be prepared and presented to the states for their voluntary use in identifying the level of crashes/violations/involvements by suspended, revoked or denied (S/R) drivers.

American Association of Motor Vehicle Administrators, Suite 910, 1201 Connecticut Avenue, N.W., Washington, D.C. 20590
\$62,334.00

To be completed eighteen (18) months from date of contract award (29 Sep 77).

DOT-HS-7-01804

DATA SOURCES TO SUPPORT THE NHTSA DEFECTS INVESTIGATION SYSTEM

The determination of what accident and related data would be useful to the National Highway Traffic Safety Administration's (NHTSA) Defects Investigation System at various stages of its operation shall be made as well as how these data may best be utilized. 0s s

The University of Michigan (HSRI), 260 Research Admin.

DOT-HS-7-01805

METHODOLOGY DEVELOPMENT FOR MEASUREMENT AND CODIFICATION OF OCCUPANT COMPARTMENT INTRUSION

A methodology for uniform measurement of intrusion into the occupant compartment and expression of this information in codified form shall be developed. While various types of intrusion shall be addressed, particular emphasis shall be placed on side intrusion with respect to FMVSS 214.

The Regents of the University of Michigan, 260 Research Administration Building, Ann Arbor, Michigan 48105
\$36,530.00

To be completed six (6) months from date of contract award (30 Sep 77).

DOT-HS-6-01806

TEST AND EVALUATION OF FMVSS NO. 103, "WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS ON LIGHT DUTY TRUCKS," "IDLE TEST VS. ROAD LOAD TEST"

Comparative data on windshield defrosting patterns shall be obtained by testing three (3) light-duty trucks in both the idle and road load test modes of FMVSS 103 and FMVSS 103 (modified) for evaluation and comparison of the test modes. The data obtained will be used to support future rulemaking concerning windshield defrosting and defogging systems on trucks, buses, and multipurpose vehicles.

Approved Engineering Test Laboratories, 1536 East Valencia Drive, Fullerton, California 92631
\$36,975.00

To be completed six (6) months from date of contract award (30 Sep 77).

DOT-HS-8-01860

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be conducted for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents.0

State of Washington, Washington Traffic Safety Commission, P.O. Box 1399, Olympia, Washington 98501
\$77,615.00

To be completed by 1 Jan 81.

Reporting System (FARS), a national computerized data collection system which contains reports of fatal traffic accidents on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents. 0ina

State of Arkansas, Department of Public Safety, 116 Nat'l Old Line Building, Little Rock, Arkansas 72201
\$120,270.00

To be completed by 1 Jan 81.

DOT-HS-8-01866

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be conducted for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records for each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents. 0ina

State of Idaho, Idaho Transportation Department, Division of Highways, P.O. Box 7129, Boise, Idaho 83707
\$33,459.00

To be completed by 1 Jan 81.

DOT-HS-8-01867

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be conducted for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records for each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents. 0.

State of Florida, Department of Highway Safety and Motor Vehicles, Neil Kirkman Building, Tallahassee, Florida 32304
\$57,824.72

To be completed by 1 Jan 81.

Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records for each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents.

State of Oklahoma, Room G-80, Jim Thorpe Bldg., 2101 N. Lincoln, Oklahoma City, Oklahoma 73105
\$64,827.00

To be completed by 1 Jan 81.

DOT-HS-8-01885

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be conducted for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records for each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. The gathering of data may also involve providing all available information on other specific types of accidents such as air bag accidents and air-brake truck accidents. 0.

State of Louisiana, Louisiana Highway Safety Commission, P.O. Box 44061-Capitol Station, Baton Rouge, Louisiana 70804
\$76,478.00

To be completed by 1 Jan 81.

DOT-HS-6-01367 Mod. 3

DEVELOPMENT OF CALIBRATION AND TEST PROCEDURES FOR THREE-YEAR-OLD COMPLIANCE TEST DUMMY

A concepted child dummy (three-year-old size) calibration procedure shall be examined and verified via independent testing. On the basis of these tests, a finalized and validated calibration test procedure shall be provided. att

The University of Michigan, Div. of Research and Development Admin., Research Admin. Bldg. - North Campus, Ann Arbor, Michigan 48105
Increased \$9,740.00

To be completed by 1 Jan 78.

DOT-HS-6-01383 Mod. 5

OPTIMIZED BRAKE INSPECTION

In addition to analyzing vehicle inspection in use (VIU) data for Task 2 (Brake Inspection Items and Criteria), an additional

66 repair records of 1974 model year data and an additional 5,403 repair records of 1975 model year shall be purchased from Peterson, Howell and Heather (PHH). The PHH repair records will be analyzed along with the VIU data to compute component failure rate distributions for use in calculations of measures of effectiveness for brake inspection programs. Also, all data bases utilized and/or created, including data collected on DOT Contract DOT-HS-093-2-432, shall be processed into SPSS mode and preserved on tape to be turned over to the Government at or before the contract completion date.

Ultrasonics, Inc., 2400 Michelson Drive, Irvine, California 92715
Increased \$15,661.00
Extended to 31 Dec 77.

DOT-HS-6-01388 Mod. 4

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief. 00

Dynamic Science, Inc., 1850 West Pinnacle Peak Road,
Phoenix, Arizona 85027
No change
No change.

DOT-HS-6-01389 Mod. 2

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief. 00

University of Miami, Coral Gables, Florida 33124
Increased \$2,240.00
No change.

DOT-HS-6-01390 Mod. 3

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief.

Calspan Corporation, Post Office Box 235, Buffalo, New York 14221
No change
No change.

DOT-HS-6-01391 Mod. 4

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief.

Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas 78284
Increased \$2,480.00
No change.

DOT-HS-6-01392 Mod. 3

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief.

Indiana University Foundation, 355 N. Lansing Street,
Indianapolis, Indiana 46202
Increased \$7,101.00
No change.

DOT-HS-6-01393 Mod. 2

NATIONAL CRASH SEVERITY STUDY

The magnitude of the involvement of stolen vehicles in accidents shall be determined. Although it is intuitively felt that stolen vehicles would be overinvolved in accidents, the magnitude of this problem is presently unknown. Therefore, research into this problem is necessary to determine if present anti-theft devices are sufficient to deter the amateur thief. 00

University of Michigan, 260 Research Administration Building,
Ann Arbor, Michigan 48109
No change
No change.

DOT-HS-6-01456 Mod. 3

SYSTEM ANALYSIS OF A GENERAL DETERRENT COUNTERMEASURE PROGRAM

The General Deterrence/DWI (driving while intoxicated) model, as currently structured, will be expanded to include more detailed descriptions of the relevant system components (enforcement, adjudication, public information). The objective is to develop a model that contains sufficient detail regarding the functioning of the general deterrence/DWI system, so that it can be used to specify future research requirements in this area, and ultimately to evaluate proposed countermeasure approaches. This additional effort will provide verbal descriptions of system and subsystem functions and definition of

april 30, 1978

DOT-HS-7-01536 Mod. 1

potential impact resulting from the introduction of alternative countermeasures. Oh s

Anacapa Sciences, Inc., 2034 De la Vina, P.O. Drawer Q,
Santa Barbara, California 93102
Increased \$27,429.00
Extended to 30 Apr 78.

DOT-HS-6-01456

SYSTEM ANALYSIS OF A GENERAL DETERRENT COUNTERMEASURE PROGRAM

A general deterrent alcohol countermeasure program that is based on increased DWI (driving while intoxicated) apprehension and public awareness of apprehension shall be defined. The system elements that will influence the individual driver's drinking-driving behavior, i.e., those factors that will determine the outcome of the program, shall be identified, as well as the components that constitute a general deterrent program and the interrelationships of the components that will have a possible effect on the system elements. The effectiveness of such a program from available data shall be estimated. The studies required to collect the necessary data to determine the actual feasibility of the program shall be identified.

Anacapa Sciences, Inc., 2034 De la Vina, P.O. Drawer Q,
Santa Barbara, California 93102
\$99,994.00

To be completed 12 months from date of contract award.

DOT-HS-6-01459 Mod. 3

DEVELOPMENT AND FIELD TESTING OF TECHNIQUES FOR INCREASING THE CONSPICUITY OF MOTORCYCLES AND MOTORCYCLE DRIVERS

Using the procedures defined in the test plan developed and approved for Task 2, the following additional experimental conspicuity treatments shall be evaluated: applied to motorcycle, day (combined fluorescent/retroreflective fairing; reduced brightness headlight; lane position, motorcycle alone; lane position, motorcycle in platoon with another vehicle), night (retroreflective orange fairing, running lights, wheel markers, combined fluorescent/retroreflective fairing); applied to motorcycle driver, day (fluorescent orange helmet, fluorescent orange vest, fluorescent green helmet and vest, combined fluorescent/retroreflective helmet and vest), night (retroreflective green helmet and vest, combined fluorescent/retroreflective helmet and vest); applied to both motorcycle and driver for both day and night, combination of best motorcycle treatment with best driver treatment; and applied to moped, day (no treatment (control), bicycle flag), night (no treatment (control), retroreflective bicycle flag). 0 of

The University of Michigan, Office of Research
Administration, 260 Research Administration Building, Ann
Arbor, Michigan 48105
Increased \$66,890.00
Extended to 16 Oct 78.

DOT-HS-6-01472 Mod. 2

ADAPTATION OF THE SOLID STATE DIGITAL

Additional testing of the vehicle data recorder shall be performed. The test equipment (chest deflection gauge and the vehicle recorders) will be prepared, inspected, and shipped to the Safety Research Laboratory (SRL) in Riverdale, Maryland. At least one technical engineer fully cognizant of operation and use of equipment available at SRL will instruct how to install, use and extract data for a minimum of one week to a maximum of two weeks. A final report will be prepared which will recap the development of the equipment, detailing its design and performance characteristics. 0ycl

Kaman Sciences Corporation, 1500 Garden of the Gods Road,
P.O. Box 7643, Colorado Springs, Colorado 80933
Increased \$2,925.00
Extended to 31 Dec 77.

DOT-HS-6-01477 Mod. 7

STANDARD ENFORCEMENT TESTING PROGRAM TESTING OF PASSENGER VEHICLES FOR COMPLIANCE WITH FMVSS NOS. 219 AND 301-75

In addition to the testing required under Delivery Order No. 8 for Truck/MVP Frontal Impact Test and Rollover for FMVSS No. 301, Fuel System Integrity (GVWR 6,000 to 10,000 lbs), these ten (10) trucks shall be tested in accordance with FMVSS No. 219, Windshield Zone Intrusion.

Approved Engineering Test Laboratories, 1536 East Valencia
Drive, Fullerton, California 92631
Increased \$5,500.00
Extended to 9 Sep 78.

DOT-HS-7-01536 Mod. 1

LEGAL CONSTRAINTS RELEVANT TO COUNTERMEASURES

Project Tasks 1 through 6 for the countermeasures identified in List B (Secondary Emphasis) on pages 6 and 7 of Exhibit A of the original Statement of Work shall be carried out. The description of two of the items in the list of countermeasures classes specified in the original work statement is modified to read: Evidential Roadside Tester - add: "Use of the Remote Collection Device in conjunction with the Evidential Breath Tester to collect and store breath samples for subsequent analysis for Breath Alcohol Concentration"; ORBIS III - change the title to "Non-Enforcement Personnel/Devices (e.g. ORBIS III)" and add: "Use of non-enforcement personnel to collect information on driving performance and dissemination of this information to produce a deterrent effect - citizen reporting of unsafe behaviors, media reporting of accidents (or violations or enforcement actions), use of Citizen Band radio to disseminate information on enforcement presence. Examination of the legal issues associated with the use of a variety of

DOT-HS-7-01577 Mod. 2

speed measuring devices other than ORBIS III (e.g. radar)." 0o
a

The Regents of the University of Michigan, 260 Research
Administration Building, The University of Michigan, Ann
Arbor, Michigan 48109
Increased \$99,900.00
Extended to 1 Mar 79.

DOT-HS-7-01577 Mod. 2

TRAINING PROGRAM FOR THE NATIONAL ACCIDENT SAMPLING SYSTEM

A three- to five-day seminar entitled "Team Management Seminar" shall be designed and shall be conducted during the eighteenth week of the initial training cycle of the NASS (National Accident Sampling System). The class shall include all team personnel who warrant training, and shall be identified by the contractor. The Team Management Seminar will be the fourth formal training experience in the initial NASS training cycle, the first three being Introduction to NASS Field Techniques, On-the-Job Training, and Advanced NASS Field Techniques.

Allen Corporation of America, 517 South Washington Street,
Alexandria, Virginia 22314
Increased \$9,996.00
No change.

DOT-HS-7-01588 Mod. 1

LIGHTWEIGHT SUBCOMPACT VEHICLE SIDE STRUCTURE

The requirements of the work being performed to modify and test the side structure of lightweight subcompact vehicles shall be increased to include the following: collection of baseline data using a selected 1978 model car as the striking vehicle against the selected lightweight subcompact; and analysis, production engineering, and fabrication of the improved compact side structure as developed in Contract DOT-HS-5-01104. The following tests shall be conducted using the two vehicles: a frontal offset dynamic crash test, a side oblique crash test, a frontal offset static crush test, and a side oblique static crush test. 0s (

The Budd Company, Technical Center, 300 Commerce Drive,
Fort Washington, Pennsylvania 19034
Increased \$139,960.00
Extended through 30 Nov 78.

HSL 78-04

DOT-HS-7-01602 Mod. 1

TRUCK AND TRAILER YAW DIVERGENCE AND ROLLOVER

A cab vibration study shall be performed in order to establish a basis for understanding the ride vibrations of cab-over and conventional heavy road tractors.

The University of Michigan, Div. of Research Development
and Admin., Research Admin. Bldg. - North Campus, Ann
Arbor, Michigan 48109
Increased \$41,031.00
Extended to 19 Mar 79.

DOT-HS-7-01666 Mod. 1

SPECIAL MOTOR VEHICLE DIAGNOSTIC INSPECTION DEMONSTRATION PROJECT-- TECHNICAL SUPPORT FOR PROJECT CONCEPT AND DEFINITION

A consumer satisfaction survey of the commercial automotive repair/diagnostic industry shall be conducted. The objectives of this survey are to determine the factors that are important to consumers when choosing a repair/diagnostic facility; to determine consumers' general attitudes toward repair facilities and diagnostic centers; to categorize and define consumer experiences with repair and diagnostic facilities; and to correlate the above information on consumer selection factors, attitudes, and experience with the characteristics of the repair/diagnostic facilities to which the consumers take their cars.

Transportation Consulting Division, Booz-Allen and Hamilton,
Inc., 4330 East West Highway, Bethesda, Maryland 20014
Increased \$74,900.00
No change.

DOT-HS-7-01807

REQUIREMENTS ANALYSIS FOR HEAVY VEHICLE DRIVER LICENSING

The problem of operator qualification for heavy vehicles regulated by the Bureau of Motor Carrier Safety as well as those regulated by the States shall be defined; and a systematic approach to improving all elements of the qualification and requalification of drivers of heavy trucks, buses, tractor-trailers, semitrailers, and full trailers shall be developed. The following tasks shall be accomplished: identify the seriousness of the commercial truck/bus accident problem; identify approaches to improve driver licensing and regulation, including improved record screening, written examinations, behind-the-wheel examinations, and visual testing; analyze the feasibility of a Federal driver's license; and develop a program plan for the development and implementation of a commercial-vehicle operator licensing programs,

April 30, 1978

DOT-HS-8-01825

DOT-HS-7-01811

FEASIBILITY OF DEVELOPING TRAINING PROGRAM DESIGNED TO IMPROVE DEFICIENT DRIVERS

The feasibility of developing a training program to improve deficient driver factors shall be determined. Driver factors (i.e. knowledge, skills, and attitudes) are the predominant causes of traffic accidents; they are causally related to approximately 85% of all such accidents and probably contribute to more. The feasibility study shall be divided into the following three phases: evaluation of present capability to identify deficient driver factors, determination of the feasibility of developing a training program based on deficient driver factors, and provision of a list of prioritized instructional objectives, or, if it is judged not feasible to develop such a training package, provision of a plan for modifying current systems.

Indiana University, Institute for Research in Public Safety,
400 East Seventh Street, Bloomington, Indiana 47401
\$52,832.00

To be completed six (6) months from date of contract award
(30 Sep 77).

DOT-HS-7-01813

NHTSA CONTRACT FILE SYSTEM

A computerized data file system for National Highway Traffic Safety Administration (NHTSA) contracts shall be produced, installed, and checked out. The system shall be written in ANSI COBOL or assembler and shall operate on the 1108 at the National Bureau of Standards. Interactive typing terminals shall operate at 300 baud with ASCII codes. The batch terminal for output shall be the COPE 1600. The system shall provide, as a minimum, specified updates, printed reports, and interactive inquiry. or

"This contract is awarded by the Small Business Administration under the authority of Section 8(a) of the Small Business Act (USC 637a), and will be administered by the Department of Transportation, National Highway Traffic Safety Administration."

\$11,999.00
To be completed five (5) months from date of contract award
(30 Sep 77).

DOT-HS-7-01815

CITIZENS BAND TRAINING PROGRAM

A training program for Citizens Band (CB) Emergency Monitors participating in the NEAR (National Emergency Aid Radio) Program shall be developed. This training program will provide for efficient handling of CB communication from the highway user in order to improve response to highway emergencies. A training film, course guide, instructor's lesson plan, and student study guide shall be provided.

React International, Inc., 111 East Wacker Drive, Chicago,
Illinois 60601
\$70,790.00

To be completed by 2 Feb 78.

DOT-HS-7-01818

COMMUNICATIONS COMPATIBILITY STUDY

Existing Emergency Medical Services (EMS) Communications Systems shall be reviewed in order to identify operational problems and design deficiencies. The study will examine the requirements for operation of an EMS Communications System as one part of an overall Public Safety Communications System and will determine if these requirements can be met under all foreseeable conditions. On the basis of the review and using good communications engineering judgment, the study will make recommendations for standardized design and operation of the system. These recommendations should minimize the number of changes and the costs to change both existing systems and commercial equipment lines as well as minimize total system cost.

Systech Corporation, Codd Professional Building, Severna Park, Maryland 21146
\$37,071.50

To be completed twelve (12) months from date of contract award (30 Sep 77).

DOT-HS-8-01824

PEDESTRIAN INJURY CAUSATION PARAMETERS

Data shall be collected for 350 pedestrian/motor vehicle (passenger cars, pick-ups, and van vehicles less than 6,000 lbs) accidents occurring in a metropolitan area with a population exceeding 500,000. In addition, all police reports of all pedestrian/motor vehicle accidents occurring within the collection area during the data collection period shall be obtained. The accident data are for support of the Motor Vehicles Program of the National Highway Traffic Safety Administration (NHTSA) which is seeking to develop an engineering position to support motor vehicle crashworthiness rulemaking policies designed to reduce fatalities and injuries resulting from pedestrian/motor vehicle accidents0 mi

Biotechnology, Inc., 3027 Rosemary Lane, Falls Church, Virginia 22042
\$215,098.00

To be completed twenty-seven (27) months from date of contract award (4 Jan 78).

DOT-HS-8-01825

UTAH 55 MILE PER HOUR SPEED ENFORCEMENT DEMONSTRATION PROJECT

A 55 Mile Per Hour Speed Enforcement Demonstration Project shall be conducted in the State of Utah. 0 a

Department of Public Safety, Utah Highway Safety Division, 455 East 4th South, Suite 314, Salt Lake City, Utah 84111
\$100,000.00

To be completed fourteen (14) months from date of contract award (22 Feb 78).

DOT-HS-8-01827

POLICE ENFORCEMENT PROCEDURES FOR UNSAFE DRIVING ACTIONS (NON-DISCRETE MOVING VIOLATIONS)

An assessment shall be made of police enforcement procedures for non-discrete moving violation unsafe driving actions (UDA's). The objectives of this study are: to identify and document the existing police enforcement techniques which are (or can be) used to detect and apprehend drivers who commit non-discrete moving violation UDA's; to determine the impact of these techniques upon the observed incidence of non-discrete moving violation UDA's; and to the extent possible, make a preliminary identification of the specific elements of these procedures that are associated with effectiveness/noneffectiveness. veh

The University of Michigan, 260 Research Administration Bldg., Ann Arbor, Michigan 48109
\$204,485.00

To be completed fifteen (15) months from date of contract award (9 Jan 78).

DOT-HS-8-01843

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports.

State of Mississippi, Department of Public Safety, P.O. Box 958, Jackson, Mississippi 39205
\$45,102.00
1 Jan 78 through 31 Dec 80.

DOT-HS-8-01853

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports.

State of Georgia, Georgia Department of Public Safety, Post Office Box 1456, Atlanta, Georgia 30301
\$150,800.00
1 Jan 78 through 31 Dec 80.

DOT-HS-8-01859

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports.

State of New Mexico, Department of Motor Vehicles, Traffic Safety Division, Manuel Lujan, Sr. Bldg., Santa Fe, New Mexico 87503
\$57,134.00
1 Jan 78 through 31 Dec 80.

DOT-HS-8-01872

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports. 6d,

State of Oregon, 1905 Lana Avenue, N.E., Salem Marion, Oregon 97310
\$63,418.77
1 Jan 78 through 31 Dec 80.

DOT-HS-8-01875

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic accident; attend conferences where training will be provided, problem areas identified, quality control probed, and new developments analyzed; and submit reports.

State of Kentucky, Kentucky State Police, New State Office Building, Frankfort, Kentucky 40601
\$78,354.01
1 Jan 78 through 31 Dec 80.

DOT-HS-8-01884

FATAL ACCIDENT REPORTING SYSTEM (FARS)

The following work shall be performed for the Fatal Accident Reporting System (FARS), a national computerized data collection system which contains reports of current data on all motor vehicle traffic accidents in which there is a fatality: gather data; manually code records of each fatal traffic ac-

april 30, 1978

NHTSA-7-A089

problem areas identified, quality control probed, and new developments analyzed; and submit reports.

State of Alaska, Department of Public Safety, Pouch N,
Juneau, Alaska 99811
\$32,624.00
1 Jan 78 through 31 Dec 80.

NHTSA-7-A089

BATTERY EXPLOSION TESTS AND LABELING

Currently available data shall be investigated and limited tests shall be conducted in an effort to obtain a better perspective of the safety problem of exploding automotive batteries and of means to lessen the hazards and societal costs associated with this problem. The objectives of this study are as follows: using the data base available from the Consumer Products Safety Commission, and any other readily available data source, further define the incidence of battery explosions, the severity of resultant injuries and the total societal costs associated with the explosions; conduct tests on batteries to determine the susceptibility of batteries to explosions under normal and adverse (overcharging, reverse polarity jumping, etc.) circumstances; develop an acceptance test procedure for determination of the explosion resistance of batteries; propose a standard method of battery and/or vehicle labeling of the hazards of battery explosions; propose a standard procedure for the jump starting of vehicles; and assess the adequacy of jump starting cable assemblies and recommend a standard.

Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096

To be completed eight (8) months from date of contract award.

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY
ADMINISTRATION
Washington, D.C. 20590

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